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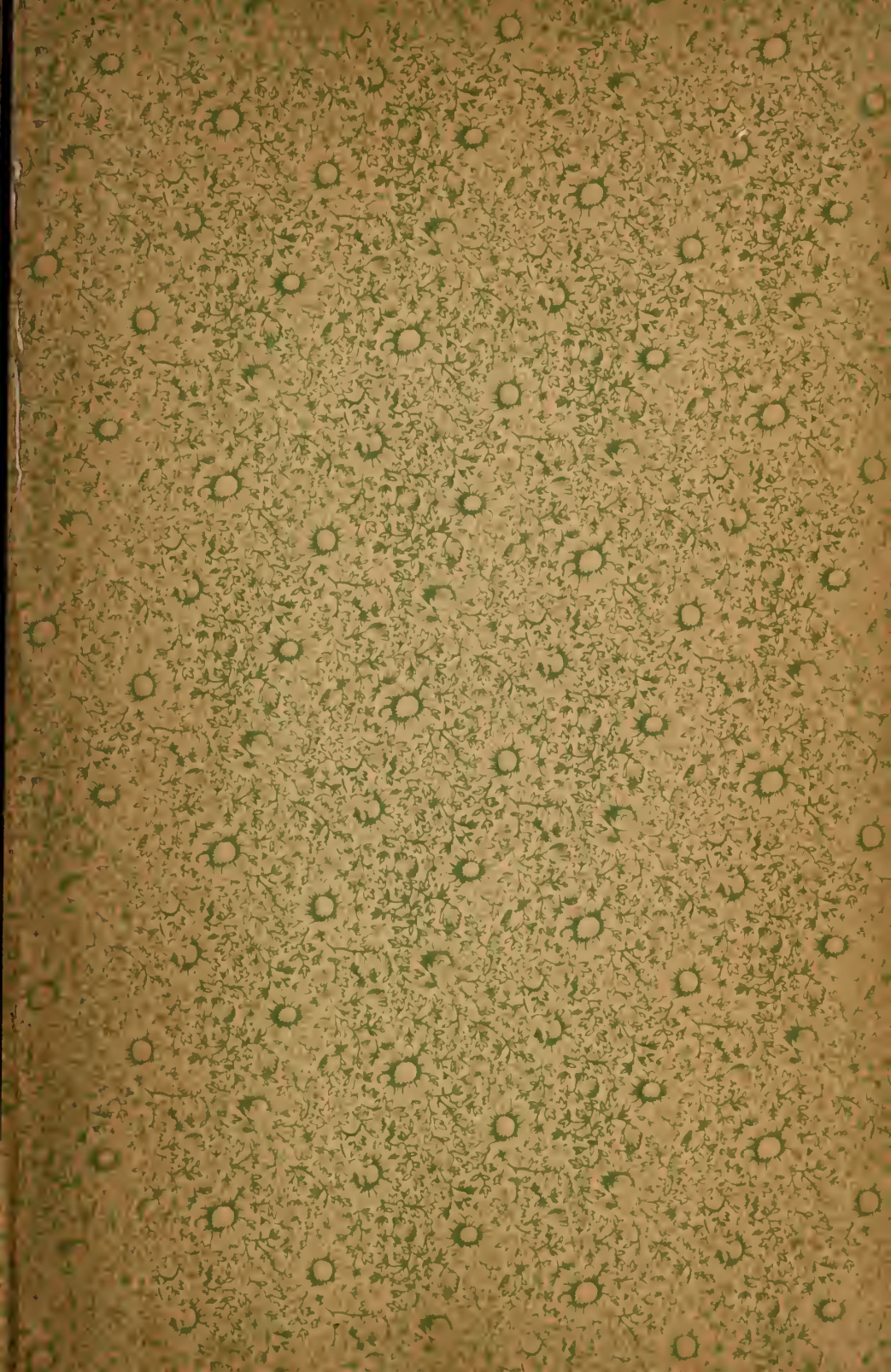
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THE DENTAL REVIEW

DEVOTED TO THE ADVANCEMENT OF
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C. N. JOHNSON, M. A., L. D. S., D. D. S.
EDITOR

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No. 1

IMPLANTATION OF ARTIFICIAL ROOTS FOR CROWN AND BRIDGE WORK.*

BY DR. E. J. GREENFIELD, WICHITA, KANSAS.

The surprising developments connected with that branch of our profession known as prosthetic dentistry are creating widespread interest and study, and this is as it should be. Anything so vitally useful to us as a mode or means of successfully restoring the organs of mastication is worthy of our closest scrutiny and analysis.

I think I am safe in saying that every man present is aware of the countless attempts that have been made to devise a method by which the replacement of natural teeth after extraction could be accomplished. In view of these facts I am certainly much indebted to the members of this society for the opportunity to appear before them in a discussion of the implantation of artificial roots.

To begin with let us look into the conditions prevailing and the results accomplished generally in cases of implantation of natural teeth. As practicing oral surgeons you have all probably implanted quite a number of natural teeth.

You know then, how unsatisfactory they are. You have no doubt found that five years is a long life for the majority of them. It is a matter of rather general experience that the implanted natural root fails—simply disappears. Similarly to the deciduous tooth, nature absorbs it. The natural implanted tooth fails because of the rarefying inflammation which occurs at the seat of implantation.

The end results can readily be demonstrated by experimentation, which will prove that when new bone is implanted in osseous

*Read before the Wisconsin State Dental Society, July, 1913.

tissue the grafts naturally die, and are gradually substituted by the formation of new bone. Now with dead bone we find a more rapid dissolution, and the defect becomes filled with connective tissue, with latent osteosclerosis or condensation. By analogy, the same must be true of the natural implantation of teeth.

To go into the minute embryological formation of cartilage and its replacement by bone is a matter too remote for this discussion; suffice to state that bone tissue is developed from the mesoblastic layer of the embryo or the mesoderm, as is all connective tissue. But to go into the pathological anatomy of new bone formation is a necessity in a discussion of the artificial implantation of teeth, for it is with this knowledge alone that we are able to understand the process, and gain a clear conception of what we are doing.

When an artificial root is implanted in either maxilla, a celluloplastic exudation forms around and between the meshwork of the root of iridio-platinum wire. This exudation is soon converted into granulation tissue, and inasmuch as the constituent cells are derived from bone, they early manifest a bone forming or osteoblastic function. The periosteum becomes thickened and more vascular, and is slightly loosened for a short distance by an exudation of plasma, which is soon followed by a new deposit of spongy bone on the surface as the result of the irritation.

The granulation tissue from the periosteum unites with that from the bone, forming what might be called the provisional or ensheathing callus. The transformation of this callus into bone starts from the periosteum by the multiplication of the osteoblastic cells and their invasion into the granulation tissue or callus, the cells being derived from the osteogenetic layer of the periosteum.

It will thus be obvious that the continuity of the bone is restored long before the act of repair is completed, and that the end result depends on the ossification of the ensheathing callus. The time necessary for the removal of the clot and the formation of the granulation tissue is about a week or ten days, and new bone formation commences about the first week. By the fourth or sixth week, according to size of the cavity, the degree of immobilization of the root, and the recuperating power of the individual, the union will be completed and all tissues consolidated.

Now having agreed that even with the most careful work, the implanted natural tooth fails to meet the demands of the profes-

sion, and having investigated the pathology, and the method of bone restoration prevailing in the operation whereby artificial roots are implanted, let us take up next the matter of technique.

I am sure you will all be interested in the process and instruments essential to the success of this operation. Though, for years, I was searching constantly for a substitute for the grafting of natural teeth, and though having at my beck and call all of the advantages, facilities and equipment of modern dentistry, my actual discovery of artificial root implantation was somewhat due to chance. One night a few years ago I happened to be present at a very difficult operation. I watched the surgeon reduce a fracture in which he used a silver wire suture. Then and there came the problem-solving query:

"If a surgeon can use metals, in bone
why not dentists also?"

Inspired by this thought, I set to work with increased energy and it seems to me that the activity resulting from that chance observation of a surgical operation has produced a process which is perhaps as audacious and revolutionizing in prosthetic dentistry as were the discovery and use of wireless telegraphy, radium and X-rays in their particular fields of science. For this discovery in actual concrete form is an artificial root that is permanent.

I have tested and proven it repeatedly with continued success. I have demonstrated before clinics in all parts of the country that artificial roots can be put into the human mouth to stay. For this new process of implantation is no less than the making of a few circular incisions in the jawbone of a toothless mouth, inserting properly prepared artificial roots of iridio-platinum, mounting on each a base or anchorage, to which can be attached a full set of permanent, natural-appearing teeth, capable of rendering as good and efficient service as those endowed by nature at her best. The mechanical side of this wonderful process is so utterly simple that it will be readily understood, and proficiency in its use will be quickly acquired by all who desire to use it.

The artificial root used for this process is a hollow latticed cylinder of iridio-platinum 24 gauge, soldered with 24-karat gold. It is impervious to acids and does not injure the tissue which grows about it. The disc-shaped cast base with groove or slot in which

the crown attachment is inserted is made of 22-karat gold and soldered to the metal frame of the roots.

Special machinery is necessary for cutting and shaping these roots. Absolute accuracy is essential, for the artificial root must fit exactly the circular incision or socket made for it in the jawbone of the patient.

These roots are made in three different sizes or diameters, $3/16$, $5/16$ and $7/16$ of an inch, respectively, and are $1/2$ inch in length. As a rule, the $7/16$ inch size can be used for supporting a molar and the two smaller sizes for bicusps and anterior teeth. The character of the ridge, however, in which the roots are to be implanted must serve as an ultimate guide in the selection of the proper size of root for the operation. In a small narrow ridge use the small root whether for a molar or a front tooth. The length of the root— $1/2$ inch—is ample for any case. Often it will be necessary to shorten the root a little by removing a layer of the crate-like root-frame.

Thorough sterilization of these roots and the instruments used, of course, always precedes the operation of implanting them. When everything is ready and the patient has been put under an anesthetic—either general or local—cleanse the gum with ether, then paint with tincture of iodine. Next use a tubular knife in the dental engine to take out the gum tissue.

The remainder of the operation is performed with a cylindrically shaped drill or trephine which is made in the same three widths as are the roots, and likewise the selection of the drill for any particular operation is determined by the character of the ridge in which the trephining is to be accomplished. Use the trephine first with the center rod in place, to hold the instrument in position as it starts the socket in the jaw.

After the socket is started remove the trephine for a moment and take out the center rod. Then continue the excavation to about $3/8$ inch depth in the alveolar process or bony structure which supports the teeth. In the absence of alveolar process, trephine to a depth of $1/4$ inch in the jaw bone plus whatever depth is necessary, if any, to permit the tooth-supporting base of the root to be evenly imbedded in the gum tissue.

From the above it will be observed that it is absolutely essential to excavate the root-socket to exactly the right depth. Condi-

tions determining this depth may vary, but in any event the attachment for the crown of the root, when in position, must be on a level with the outer surface of the gum tissue. Note that there is a row of holes punched through the cylindrical wall of the trephine around its center, to serve as a guide to depth in trephining.

Thus far the operation should have consumed about five minutes' time. The circular socket in the jaw bone is now finished and the patient can be allowed to regain consciousness.

The root socket should now be filled with bismuth paste. (Bismuth subnitrate 30.0, white wax 5.0, soft paraffin 5.0, vaselin 60.0 parts by weight, mix while boiling.) Then place the thoroughly sterilized artificial root in position, i. e., sink it down around the bony core or center of the root socket.

Once in place, the artificial root should not be removed. But if for any reason there is absolute necessity for its removal, care should be taken not to rotate the root, as it is taken out, for doing so might fracture or pull out entirely the core of the socket.

In the course of a week or ten days after operating all sensitiveness has abated largely and in six weeks' time, rarely longer, the bony tissues of the jaw have united through the latticed root structure and a positive anchorage is provided for the attachment of the artificial denture.

By means of the bony core, which the trephine produces, in making the incision or root socket, the artificial root after being placed in position will be held firm until a sufficient deposit of the bone cells has filled the spaces in the root frame. Thus the artificial root becomes solidly imbedded in the jaw.

This bony center of the root socket is one of the chief factors in the success of this process of implantation. It assures the fit of the artificial root in the socket trephined for it, and an absolutely accurate and certain fit is decidedly essential to permanency and endurance.

Without this core or center, splints would be necessary. Without this core or center there would be no possibility of operating on a dentureless jaw; but with it, there are practically no limits to what can be done in prosthetic dentistry. It is this feature of this process which makes it so inviting and interesting to all members of the profession, especially when you compare the results ac-

complished, with the end results of the implantation of natural teeth.

In cases of the entire loss of the teeth, incisions are made at predetermined points in each jaw, to give sufficient anchorage for artificial abutments, in either maxilla for bridge work.

The danger of these operations may be thought greater, possibly than the benefits to be derived from them. But such is not the case where attention is given to the prevention of infection by keeping everything sanitary and sterile, a precaution every dental surgeon should exercise in performing any operation.

The conditions limiting to any extent the success of this process of implantation are decidedly few in number, and inconsequential as to effect. The condition of the patient physically must, of course, be taken into consideration as it always is in any operation. Given a patient anywhere near normal, and you should have little trouble in implanting an artificial root.

The nature of the maxilla, or the ridge in which the intended implantation is to be made, also has somewhat to do with the success of the operation. The subsequent solidity of the implanted root depends largely on the amount of the area (the width and depth) of the ridge available for your operation.

Do not place this operation in the same class with all other implantations. Do not figure that this process, like all other implantations, comes to the same end. Do not fear that infection is going to occur. If you insert in the maxilla a solid body, there would be room for infection to set in around it. But you do not do this. You place a cage-like hollow cylinder, in a circular socket in the maxilla. This root is open all the way up, clear to the gum; and the circulation carries away any bacteria which might otherwise be destructive. This is one of the main features for the success of this process of artificial root implantation. If the root were a solid body or even simply perforated, it would be thrown out, nature would not tolerate it. There would be room for infection.

Another point limiting the conditions of hindrance to the success of this operation, is the simplicity of the operation. It is not difficult or complicated. It can be performed in a few minutes.

A still further point is the immovability of the root—once implanted this artificial root is solid; it is stationary. The bony core in the center of the socket assures solidity.

I have implanted both natural teeth and the artificial kind, so I speak from experience when I say that the absorption which takes place in a few years and absolutely destroys the natural implanted tooth, can be avoided by this process, which provides for the anchoring in the jaw of good, solid imperishable artificial roots.

In certain cases when the implantation is to be made in the upper maxillary and the conditions of the ridge or jaw-bone are such as to present a possibility of trephining into the antrum, I have varied the usual procedure of this process.

In such cases, when I have reached the point where I am ready to make the final trephinement—after having started the socket and removed the center rod, I make only a partial incision. That is, instead of trephining to such a depth as will imbed the instrument clear up even with the row of holes punched in the cylindrical wall around the center, I drill just half that distance.

Then with a small circular-saw wheel-drill which just fits into the circumference of the socket already trephined, I make an incision on each side of the socket. These incisions are from $1/32$ to $1/16$ of an inch in length, exactly the same width as the socket and lie at exactly right angles to the two parallel edges of the jaw-bone. This produces a peculiarly shaped socket in which the artificial root is to be imbedded. Part of the socket is a complete circle. Below that two incisions on opposite sides of the circle constitute the completion of the root socket.

Such a socket requires the trimming or shaping of the artificial root until the latter will fit snugly into it. This is a simple matter. You will note that there are four stays or perpendicular portions of the platinum root that support the various circular layers or bars of the root. Just cut away all but one of these layers, leaving the two stays that are opposite each other intact.

This procedure gives the root the appearance of a clothes pin, but if the work of trimming it is accurately done you will find that the root will fit neatly into the peculiarly shaped socket you have prepared for it.

The advantage of such an implantation is readily apparent. No danger of breaking off the outer edge of the maxilla in case of a narrow ridge. No danger of trephining up into the antrum—no long waiting for the cell growth of the bone into and through the apertures of the root frame.

THE MOUTH IN THE ETIOLOGY AND SYMPTOMATOLOGY OF GENERAL SYSTEMIC DISTURBANCES.*

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A great deal has been recently said and written on the influence of septic conditions within the mouth upon the body at large, and it would seem that there is little new to be added upon the subject. But this matter needs to be still further brought to the notice of both the physician and dentist. Indeed, we should not rest satisfied until medical schools instruct their students more closely in the recognition of the various lesions of the teeth, jaws, and associated parts, and until dental schools give more time to the teaching of pathology and disease processes in general. Papers read before busy practitioners of the two professions may do a certain amount of good, but cannot materially alter points of view that have become firmly fixed. The time to instill basic principles is during the period specially set aside for this purpose, namely when the physician or dentist is in embryo, receiving fundamental instruction in all branches. At the present time, the high-grade schools of dentistry give elaborate courses in anatomy, physiology, and bacteriology. Indeed, in dental colleges connected with medical schools, the instruction in these branches is the same as for the medical students. Consequently the dental curriculum has no time to spare for general or clinical pathology, physical diagnosis, or medicine, the principles of which should be known by everyone undertaking the treatment of disease anywhere in the body. If this cannot be remedied in any other way, it seems to the writer that room should be made for instruction in these branches by curtailing the courses in anatomy and physiology, omitting parts of these subjects that are of little or no practical interest to the dentist.

The medical student on his side should be instructed in the pathology of dental caries, pulpitis, pericementitis, alveolar abscess,

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pyorrhea alveolaris, etc., so that he will be enabled for instance to differentiate a cavity in a tooth from tartar upon its surface. The need for instruction along this line is well illustrated by a quotation from what is considered the leading work on surgery at the present time. In the section on the mouth, teeth, and jaws, the writer states that "alveolar abscess has as its starting-point a carious spot about the fang of a tooth." If eminent teachers of surgery have such a crude idea of dental pathology as shown by this example, what can the medical student be expected to know of it?

The subjects of this paper can be most conveniently taken up under two headings: First, oral disease as a factor in the etiology of remote disturbances. Second, the part played by the mouth in the symptomatology of general diseases. A moment's consideration will convince one of the importance of a study of each of these to the dentist. A recognition of the former will enable him to treat his patients more intelligently, and a knowledge of the latter will frequently make it possible to form deductions leading to an earlier diagnosis of serious general disease.

THE MOUTH AS AN ENTRANCE FOR SYSTEMIC INFECTION.

The mouth acts both as an avenue or passage-way for the transmission of infected material into other parts of the body, and also as a starting-point at which disease develops and is then carried to remote places by the circulation and the digestive and respiratory tracts. "William Hunter (4) says, "My clinical experience teaches me that if oral sepsis could be excluded, the other channels by which medical sepsis gains entrance to the body might almost be ignored." This perhaps is an exaggeration, because we know that frequently people do become diseased in the absence of local infection in the mouth, but we may take it as true that practically all infection of the body barring injury or venereal disease, must gain entrance in the first place by way of the oral cavity. Perhaps the commonest of the infections in the mouth to show its effects upon other body structures is pyorrhea alveolaris. It is needless for me to go into the etiology, pathology, and treatment of this disease, but I will mention a few of the remote or general systemic results that are to be looked for in pyorrhea cases, and endeavor to point out the importance of co-operation between the dentist and the physician.

EFFECTS OF PYORRHEA ON THE GASTRO-INTESTINAL TRACT.

The swallowing of large quantities of pus and septic bacteria first causes functional disturbances of digestion and later may lead to anatomical changes along the alimentary canal. Indigestion or discomfort after taking food is often undoubtedly relieved by removing these septic foci within the mouth. It is more difficult to prove the connection between oral sepsis and gastric ulcer, duodenal ulcer, gall stones, and appendicitis, lesions which give rise to symptoms referred to the stomach, but I have no doubt that it does play a part in the etiology of these diseases by interfering with the proper functions of the organs involved. At any rate, every case of "chronic dyspepsia" should have the benefit of thorough mouth examination and treatment in order to rule out pyorrhea or other oral infection as a cause, before surgical measures are advised.

EFFECTS OF PYORRHEA ON THE VASCULAR SYSTEM.

Absorption by the lymphatics and the blood stream, of bacteria and their products often brings about toxic effects which show themselves on the composition of the blood itself. Severe forms of anemia, resembling if not indeed identical with pernicious anemia may be the result of such absorption. In order to understand the blood changes that take place in anemia, familiarity with the normal condition of the blood is necessary. The fact that the changes to be mentioned below are often caused by infection in the mouth, is sufficient excuse for going with some detail into a description of the normal blood. The three principal components of the blood that are varied by pathological conditions are the hemoglobin, the red corpuscles or erythrocytes, and the white corpuscles or leukocytes. Changes in these components can be readily estimated by simple laboratory procedures. The hemoglobin and the red cells are chiefly affected in anemia. Hemoglobin is the iron-bearing protein contained within the red cells, that furnishes the color to the blood. The amount normally present is taken as 100 per cent, and any decrease can easily be measured by means of a hemoglobinometer. In anemia the percentage of hemoglobin may be anywhere below 80 per cent, sometimes being as low as 15 per cent in pernicious anemia. The red cells or erythrocytes are normally present in the proportion of five million to the cubic millimeter of blood. In anemia they may be decreased anywhere below this, and be even lower than one mil-

lion to the cubic millimeter in pernicious anemia. The red cells in pernicious anemia not only undergo changes in number, but also in shape and appearance, staining properties, etc. Instead of being circular non-nucleated discs about 7.5 microns in diameter, the red cells may assume a variety of shapes (poikilocytosis), and be of different sizes. The presence of nucleated red cells may also be noted, a condition never found in the normal blood.

The white blood corpuscles or leukocytes are usually present in the proportion of 7500 to the cubic millimeter of blood. An increase or leukocytosis is usually present in inflammatory conditions, in which the white cells may rise to 20 or 30 thousand. In mild anemias the leukocytes show no important changes. We may find a leukocytosis in anemia, when the latter is due to infection, the leukocytes becoming normal when the infection is removed. There are other diseases having a bearing on lesions in the mouth in which important information is to be gained by examination of the leukocytes. We shall return to these later.

I can cite several cases, giving the blood picture and symptoms of pernicious anemia, with extensive pyorrhea or other septic foci within the mouth, which promptly improved after removal of these sources of infection. A young woman was admitted to the service of Dr. Alfred Stengel in the University Hospital, Philadelphia, on Nov. 1st, 1912, under a diagnosis of anemia. Her blood examination revealed 46 per cent of hemoglobin, and 2,940,000 red cells, which also showed marked variations in size and shape. On examining her mouth I found a most septic condition, the left upper central incisor tooth having a gold shell crown, was loose, with quantities of pus discharging around it. There were several other suppurating roots and decayed teeth. Under ether, I extracted all the diseased roots and loose teeth, getting the mouth into as clean a condition as possible. This was followed by immediate improvement in the general health, and she left the hospital on Dec. 21st with 64 per cent of hemoglobin and 4,350,000 red cells.

Another patient is a man aged 60, admitted to Dr. Stengel's service at the University Hospital on March 29, 1913. His blood examination on admission was as follows:

Hemoglobin, 30 per cent.

Red cells, 1,600,000.

Leukocytes, 24,400.

The hemoglobin and red cells were therefore only about one-third of normal, while the leukocytes were greatly increased, showing that he had some kind of infection. Nucleation and alterations in the shape and size of the red cells were also found. His mouth contained many teeth and roots affected by pyorrhea, and the X-ray showed even the apices of several teeth surrounded with pus. These foci of infection were all cleared out by extracting the teeth and roots, and the patient's condition is gradually but progressively improving, as shown by blood examinations made from week to week. An examination made on July 7th shows 58 per cent of hemoglobin, 2,700,000 red cells, and 6,600 leukocytes. This man's condition on admission was extremely grave, and it is doubtful on this account and because of his age whether he will fully regain his health. But the improvement following the removal of infection in the mouth has been remarkable. Of course he has had rest and other building up treatment, which have played some part in the improvement. You will observe that the leukocytes have dropped from 24,000 to about normal, following the removal of the infection.

EFFECTS OF PYORRHEA ON JOINTS.

Absorption of toxic products of bacteria and of bacteria themselves from infectious foci in the mouth frequently leads to secondary changes in joints, and many arthropathies of obscure origin may be explained by such infection. These joint changes may be acute, resembling or identical with acute articular rheumatism, or chronic, in which hypertrophic and erosive changes take place in the joint structures (arthritis deformans).

It is difficult to prove absolutely in some instances the connection between oral sepsis and arthritis, especially the chronic form, but in many cases the same microorganism has been isolated from the lesion in the mouth and from the inflamed joint. A recent paper by Hastings (3) records valuable work on this point. The improvement or cure of the secondary joint involvement after clearing up of the mouth infection is further evidence of the connection between the two lesions. A. M. Nodine (6) gives an excellent review of this subject, with full references to the literature. I have seen several cases of so-called acute articular rheumatism in which the removal of foci of infection in the mouth was followed by almost immediate fall of the temperature to normal, and disappearance of the joint pain and swelling.

EFFECTS OF PYORRHEA ON THE NERVOUS SYSTEM.

In a recent article Collins (1) describes several cases of organic disease of the nervous system which he believes were due to the streptococcus viridans, which he isolated from the pus of pyorrhea in his patients.

From this brief review it is seen what diverse parts of the body may be secondarily affected by the existence of mouth infection in the form of pyorrhea alveolaris. The commonest effects are on the gastro-intestinal tract, the blood, and the joints. The same secondary effects may result from foci of infection in the mouth other than pyorrhea alveolaris, such as blind abscesses connected with devitalized teeth. This is perhaps more serious, because the lesion is not so immediately apparent as in pyorrhea. But with the perfection of the X-ray in diagnosis, we have come to recognize that many devitalized teeth, presumably well sterilized and filled, and perhaps supporting crowns and bridges, are hidden causes of apical "blind abscesses," absorption from which is a frequent cause of systemic infection, manifesting itself in gastro-intestinal disturbance, anemia, arthritis, etc. It is not within the province of this paper to go into the local treatment of these cases, but I would suggest that there is perhaps too much conservation on the part of many dentists who persist in long attempts to save teeth that should be extracted.

Infectious foci in the mouth may lead to disease of the respiratory tract, and may play a part in the etiology of pneumonia. This is particularly true of the form known as inhalation pneumonia, caused by the inspiration of septic material into the bronchi during anesthesia. Removal of such dangerous matter from the mouth before operations under a general anesthetic is a safeguard that should never be neglected.

DECAY OF THE TEETH AND TUBERCULOUS INFECTION.

In many cases of tuberculous cervical adenitis in children, commonly known as "scrofulous glands of the neck," there is no doubt whatever that the infection gains entrance through decayed teeth. I have noted particularly in a large percentage of these children extensive decay of the first permanent molar. Tubercle bacilli have been found in the decayed teeth of such cases of some observers, thus establishing proof of the connection between the two lesions.

Thus dental disease may be the origin, first of tuberculosis of the cervical lymphatics, and from that lead to generalized tuberculosis. The chain of evidence has repeatedly been established to show that the tonsils (which may be regarded as part of the mouth) frequently afford entrance to tubercle bacilli which infect the cervical lymph nodes, and thence the general system. Geo. B. Wood (9) has published a valuable paper on this subject. These facts emphasize the futility of treating tuberculous lesions of the neck without first of all clearing up the original foci of infection within the mouth, whether they be diseased teeth or tonsils. The same remarks apply to acute infections of the cervical lymph glands, which are often dependent upon infection within the mouth, and to chronic sinuses on the face and neck. The latter frequently come from diseased teeth or roots, and may stubbornly resist all kinds of treatment for years because the cause is not recognized and removed. Occasionally a root causing the trouble may be invisible, being covered entirely by gum or bone, and may only be shown by the X-ray. A short time ago I saw a lady who had had a sinus opening just beneath the border of the jaw for two years. The opening appeared as a small red papilla on the skin of the chin, which her doctor had been treating with all sorts of external applications as a case of lupus vulgaris. On examining the mouth at first I could see nothing but smooth gum where teeth had been lost, but at last I was able to pass a probe through a narrow fissure in the gum down to a rough hard surface. The X-ray revealed a piece of root, the removal of which caused the sinus to heal up in a few days, without any other treatment. This is only one case of many I could describe, and no doubt you have often seen similar ones.

Apart from the question of infection, I may mention the indigestion caused by the swallowing of insufficiently masticated food in patients with defective teeth.

LOCAL AND REMOTE EFFECTS OF FIFTH NERVE IRRITATION.

The trifacial nerve endings in the neighborhood of the teeth may be subjected to irritation by various lesions, giving rise to local and general nervous disturbances. Among these causes of obscure pain may be mentioned septic pulp-canals, pulp-stones, impacted and unerupted teeth, and unsuspected roots of teeth that were presumably extracted. Any of these may be the source of severe pain along

the branches of the fifth nerve, which many times cannot be distinguished from true neuralgia major, even by experienced neurologists; and if a diligent search for some local cause is not made in every case of trifacial neuralgia, this neglect may result in the patient being subjected to an unnecessary major operation, such as the removal of the Gasserian ganglion. Therefore in all cases of neuralgia of the face it is of the utmost importance to search first of all for some local cause, the removal of which may result in cure. The X-ray is of the greatest value in this connection. Besides pain localized to the fifth nerve, dental lesions may give rise to headaches and other more remote disturbances of the nervous system. The late Dr. Upson of Cleveland (8) brought forward considerable evidence to show the connection between impacted teeth and various nervous and mental diseases, particularly melancholia and dementia precox. These remote reflex disturbances may occur in the total absence of any local symptoms whatever. The connection is established by immediate improvement after removal of the pathological condition in the mouth. A few years ago I saw with Professor M. H. Cryer (2) a dental student who for some months had been suffering from chorea (St. Vitus' Dance). This diagnosis was made by one of the best known neurologists in Philadelphia, who treated him unsuccessfully with the usual remedies. The patient had to give up his studies on account of his affliction. Radiographs showed that he had four impacted third molar teeth, which were extracted by Dr. Cryer. The effect was striking. The nervous symptoms almost immediately ceased, the patient was able in a few months to resume his studies, and has now graduated, without any recurrence of the trouble.

THE MOUTH IN THE SYMPTOMATOLOGY OF GENERAL DISEASES.

So many general diseases manifest themselves by symptoms in the mouth that more than a very brief mention of the commoner ones would be impossible in this paper. A consideration of the oral lesions of syphilis for instance, could easily occupy an hour or more. So that what I shall have to say will in no sense be complete.

Syphilis. We will begin with syphilis, which is probably the most important of general diseases for the dentist to recognize because of the frequency of its oral manifestations, and because of the

danger of transmission of contagion from unrecognized mouth lesions to the other persons. On the other hand, a full recognition of these lesions and of their contagious nature renders prevention of transmission easy. Dentists as a rule have an unfounded fear of treating the mouths of syphilitic persons, because they do not understand that simple sterilization by boiling of their instruments after employing them on these patients will effectually prevent transmission of the disease to others. Nor do they realize that in order to produce infection the syphilitic virus must come in contact with a break in the skin or mucous membrane. Adequate protection to the fingers in treating these cases is afforded by wearing rubber gloves. The first requirement in safely handling patients suffering from syphilis of the mouth is ability to diagnose these lesions, which as a rule is not difficult, particularly when we have at our disposal the dark field microscope and the Wassermann test. The first thing to be grasped is the fact that syphilis is a general disease, due to infection by the *treponema pallidum* (*spirochaeta pallida*), and that the disease in the cases seen by the dentist is not confined to the mouth, but affects the whole body. Therefore the diagnosis is aided by an inquiry into the history and other symptoms that may be present. Syphilis in its manifestations is divided into three stages, more or less distinct from one another, which occur in regular order. After infection with the *treponema pallidum*, a period averaging about three weeks elapses before any symptoms appear. After this time we have the primary sore or chancre occurring at the point of entrance of the syphilitic virus into the body, and only at the point of entrance. Therefore we usually have only one chancre, though there may possibly be more, due to simultaneous inoculation of several breaks in the body surface in the same region. The chancre is usually on the genitals, but may be on another part of the body surface. In the oral region we may have a chancre of the lip, tongue, palate, or tonsil, due to infection by eating utensils, kissing, wounds of the mouth by infected instruments, etc. The chancre begins as a small raised papule, which slowly increases in size, accompanied by little or no pain, which breaks down to form an ulcer about the size of a ten cent piece, and which has a hard or cartilaginous base. Absence of pain and presence of induration are characteristic features. At the same time the nearest lymphatic glands become enlarged, but are

not very painful. Thus a chancre of the lip is always accompanied by enlargement of the submaxillary lymph nodes. This is the primary stage of syphilis, and is sometimes difficult to diagnose from simple ulceration, a beginning cancer, or other diseases. The old plan was to wait until other symptoms of syphilis appeared before making the diagnosis. But now, by means of the dark field illuminator and the microscope we can often decide at once whether we are dealing with a chancre by finding the *treponema pallidum*. While the chancre is a rare lesion to find in the region of the mouth, yet its recognition is important to the dentist, as contagion from it is very readily transmitted.

We now come to the secondary stage of syphilis. The symptoms of this state first make their appearance from four to seven weeks after the appearance of the chancre. The ordinary mouth lesions are known as mucous patches, which appear as slightly raised, grayish white, oval patches on the mucous membrane, especially just within the angles of the mouth, at the sides of the tongue, and on the soft palate. The diagnosis is aided by the history of the patient having recently had a hard sore which may still be present, and by the presence of other secondary symptoms. The most important of these are a rash on the body which as a rule does not itch, sore throat, falling out of the hair and general painless lymphatic enlargement, particularly felt in the posterior cervical region, and just above the elbow on the inner side. If doubt still exists, we have in the Wassermann test of the blood a certain indication of the presence or absence of secondary syphilis provided the patient has not received antisyphilitic treatment. We shall return to the significance of the Wassermann reaction later.

After the secondary stage of syphilis, if thorough treatment has been carried out, further symptoms may not appear. Otherwise we may have a period, ranging from eighteen months to two years, in which the patient is apparently free from disease. But all this while the blood may show a positive Wassermann reaction, proving that the syphilitic virus is still present in the body in a latent form. This period of quiet is followed by the appearance of tertiary symptoms, affecting the deeper tissues of the body, such as bone, muscles, and internal organs. The typical tertiary lesion is known as a gumma, which may appear in the region of the mouth on the lip, tongue, palate, or cheek. It begins as a deep-seated, painless lump,

which softens and breaks down, leaving a punched-out ulcer. A marked characteristic of the gumma is that the lymphatic glands of the region are rarely enlarged, as they are in association with a chancre, or with a cancer or with an acute infection. So that in the case of a gumma of the tongue for instance, we would generally not be able to feel the submaxillary lymph nodes unless ulceration and secondary infection of the gumma had occurred. A gumma of the soft palate will cause extensive ulceration and irreparable loss of tissue. Where the process begins in the bones of the hard palate, necrosis generally occurs, with resulting cleft palate, the oral and nasal cavities being sometimes converted into one by the extensive destruction of the partition between them. The diagnosis of tertiary syphilis in women is often aided by an inquiry as to repeated miscarriages or birth of dead children, syphilis being the commonest cause of these conditions. Tertiary syphilitic lesions are not regarded as being so contagious as primary and secondary lesions, though the *spirochaeta pallida* may be found in them, and cases of transmission of infection from them have been reported.

Inherited syphilis presents practically the same symptoms as the acquired form, except of course that there is no chancre, the signs appear early in life, and there are certain developmental defects due to the action of the virus on the fetus before birth. The most prominent of the latter are the Hutchinson teeth. The typical deformities of Hutchinson teeth are confined to the permanent upper central incisors, though less typical defects of other teeth may be found in association with these. The central incisor is barrel-shaped, and has a crescentic cutting edge, due to a failure of development of the enamel and dentin at this point. Attempts have been made by Zinsser (10), Stein (7), and others, to prove that practically all hypoplastic defects of the teeth are due to inherited syphilis, these being ascribed by most observers to rickets, scarlet fever, measles, and other eruptive fevers common in the early years of life. While some of these defects are undoubtedly syphilitic in origin, yet we must fall back on the other diseases to account for the great majority of cases. Stein advances as his reason for ascribing dental hypoplasia to syphilis alone the point that the calcification of the tooth is complete before birth, and therefore syphilis being practically the only disease attacking the fetus in utero, it can be the only one having such a detrimental effect on the developing

dental organs. But he apparently loses sight of the fact that while the dentin may be fully calcified before birth, yet the development of the enamel goes on up until the tooth is erupted, and is therefore going on just at the period when the child is most susceptible to scarlet fever, measles, rickets, etc. I have recently obtained negative Wassermann reactions in three cases showing hypoplasia of the incisors and early central decay of the first permanent molars exactly corresponding to the cases described by Zinsser and Stein as syphilitic, who gave no history or had no other signs of the disease. Of course three cases are too few upon which to base conclusions, but they form evidence against Stein's views. In addition to the tooth defects very young children with hereditary syphilis may show the mucous patches in the mouth, and later the gumma, with necrosis and perforation of the hard palate.

Wassermann reaction. In view of the fact that whole volumes have been devoted to the Wassermann reaction, any attempt to describe it in the brief space of this paper would be useless, particularly as the actual performance of the test consumes too much time to bring it within the province of the busy practitioner. It consists in the detection in the patient's blood of certain substances produced by the action of the syphilitic virus. It is of more practical importance to you to know how to collect the blood for the test, and the interpretation of the results obtained. To obtain the blood, the patient's middle finger is first wiped off with alcohol, and the pulp of the distal end of the finger toward the ulnar side is given a deep puncture with a sharp pointed lance. This as a rule causes little or no inconvenience. About two cubic centimeters of blood should be collected in a small sterile test tube, and can usually be obtained in a minute or two by having the patient's arm hanging down and squeezing the finger after the manner of milking a cow. When the blood is obtained, the tube should be sealed with a cork, not with cotton, and put in a cool place, preferably on ice, until the test is made. Ordinarily the blood will keep in good condition for three or four days. In the past two years, in association with Dr. B. A. Thomas, at the Philadelphia Polyclinic, I have done over 2,000 Wassermann reactions, with approximately the following results in cases clinically diagnosed as syphilis:

Primary syphilis—40 per cent. positive.

Secondary syphilis—96 per cent. positive.

Tertiary syphilis—80 per cent. positive.

In the primary stage, the Wassermann reaction does not become positive until two to six weeks after the appearance of the chancre, so the test is not of great value in this stage, a negative reaction meaning nothing. In the secondary stage, the reaction should always be positive. The few cases in our series clinically diagnosed as secondary syphilis and giving a negative Wassermann, may be explained either by an error in the clinical diagnosis, or by the fact that the patients had had antisyphilitic treatment. The tendency of treatment to weaken or render negative the reaction should always be borne in mind, and if possible the patient should go for at least two weeks without treatment before the blood is taken. In the tertiary stage of syphilis the Wassermann test is not positive in such a large percentage of cases as in the secondary stage, though the percentage of positive results should approach 90. In this stage we often have a reaction that may be described as medium or weakly positive. In inherited syphilis the reaction is positive in a high percentage of cases, Stein's statement to the contrary notwithstanding. Besides being an aid to diagnosis, the Wassermann reaction is a valuable guide to treatment, as it gradually becomes negative after sufficient treatment has been given. After discontinuing treatment, the reaction may again become positive, in which case further treatment is indicated, even in the absence of symptoms. In the light of our present knowledge, we are probably justified in saying that a patient is cured of syphilis who reacts negatively to the Wassermann reaction when repeated every few months for a period of two years, after treatment has been discontinued.

I hope you will pardon the disproportionate space given to syphilis, but I feel that the importance of the disease fully merits it.

We will now pass on to the effects shown in the mouth of certain poisonous substances used as drugs or otherwise taken into the system. I shall speak briefly of only two of these, viz., mercury and lead.

Mercurial stomatitis. This is the result of the systemic absorption of an overdose of mercury, and may follow entrance of mercury into the system in any manner, whether by mouth, by hypodermic injection, by inhalation, or by absorption through the skin or mucous membrane. While mercurial poisoning is usually the result of medicinal use of mercury, it may be found in workers at certain trades employing the metal. Cases have been reported following the use

of the bichlorid of mercury in a vaginal douche. The mercurial treatment of syphilis is of course the commonest source of stomatitis. Mercurial stomatitis begins as a slight tenderness when the upper and lower teeth are brought together, and this is the first warning that the therapeutic limit of the drug has been reached. The next symptom to be noticed is a metallic taste in the mouth, followed by an increased flow of saliva (ptyalism or salivation), at the same time, the gums assume a purplish red color, become swollen and tender, and bleed easily. The teeth loosen, and may fall out. Ulceration and sloughing of the gum occur in severe cases, and the breath has an intensely foul odor. I will not go into the treatment of this condition except to say that the danger of mercurial stomatitis can be almost done away with if the teeth and mouth of the patients are put into a thoroughly clean condition before administering the drug, and kept so throughout the course of treatment. This point has been considerably overlooked by physicians in the past, neglect also being due in part to the criminal unwillingness of many dentists to handle these cases.

Lead poisoning manifests itself in the mouth by the presence of a bluish-black line in the edge of the gum at the cervical margins of the teeth. This is a very valuable sign of lead poisoning if not confused with conditions that resemble it. The black deposit is the sulphide of lead, and is distinguished from tartar by the fact that it cannot be scraped off. It is aggravated by the existence of gingivitis due to tartar, but may be found also in a comparatively clean mouth. Lead poisoning also produces gastro-intestinal symptoms—colic and constipation, cerebral symptoms—convulsions, and nervous symptoms—wrist-drop and other paralyses. Besides this, the blood examination shows a secondary anemia, characterized by a diminution in the percentage of hemoglobin and number of red cells, together with a peculiar condition of the red cells as seen in stained smears, known as stippling. The red cells take the usual pink stain, but instead of being homogeneous, many of them are dotted with fine dark blue granules. It is interesting to study the various sources from which lead gains entrance to the system. Plumbism is common in persons working at trades involving the use of lead compounds, particularly lead smelters, makers of white lead for paint, potters, who use lead in glazing, storage battery makers, and painters. Lead may also enter the system through drinking water conveyed by lead pipes, through hair dyes, and drugs.

That some relationship exists between general diseases such as gout and diabetes on the one hand, and pyorrhea alveolaris on the other, cannot be denied, nearly all cases of gout and diabetes exhibiting suppuration of the dento-alveolar ligaments with consequent loosening of the teeth. Which is the cause and which the effect, it is difficult to say in most cases. Diabetes in particular is apt to lower the vital resistance of the patient and to predispose to infection in the oral cavity, sometimes leading to a fatal outcome. The importance to the dentist of a knowledge of simple laboratory examinations in aiding the diagnosis of these and other cases has been before pointed out by the writer (5).

Finally, there are certain diseases of the blood itself, which manifest themselves by oral symptoms.

Hemophilia is due to a deficiency in the substances that produce coagulation of the blood. It is characterized by a tendency to spontaneous hemorrhages from mucous membranes, subcutaneously, and into joint cavities, and also by a difficulty in the arrest of bleeding induced by wounds. It is a disease occurring especially in males, and can often be traced to heredity. The spontaneous hemorrhage frequently involves the oral mucous membrane. The disease is of interest chiefly to the dentist because uncontrollable bleeding often manifests itself in these patients after extraction of teeth.

Leukemia is a disease of the blood-forming organs in which there is an enormous over-production of certain forms of leukocytes. The leukocyte count, instead of being in the proportion of about 7,500 to the cubic millimeter of blood, in leukemia may be anywhere between 100,000 and 500,000. In lymphatic leukemia the increase is entirely in the lymphocytes, which are found in the proportion of 90 per cent. of all the leukocytes, instead of about 25 per cent. as they should be normally. In spleno-myelogenous leukemia, there appears in the blood a form of leukocyte not present in normal blood, viz. the myelocyte, or bone marrow cell. This cell is a large leukocyte with an oval nucleus and is identified under the microscope by its affinity for certain stains. Myelocytes in leukemia may constitute 40 per cent. of all forms of leukocytes, and the total leukocyte count may reach 500,000 to the cubic millimeter in severe cases. Besides the changes in the leukocytes or white cells, the blood in leukemia shows marked diminution in the percentage of hemoglobin

and number of red cells, with degenerative changes in the latter. The spleen and lymph glands are also greatly enlarged in lymphatic leukemia, while in spleno-myelogenous leukemia we find extensive changes in the bone marrow. It is in lymphatic leukemia that we are especially apt to find mouth symptoms. These consist in swelling and ulceration of the mucous membrane of the gums and palate, accompanied by bleeding, without any obvious local cause, and which resist all forms of local treatment. This is an extremely fatal disease, and though not common, it may fall to the lot of the dentist to be the first to see the cases on account of the mouth symptoms.

Time does not permit me to consider other more or less important pathological connections between the mouth and the general system. I hope the subject has been made interesting, not only from a purely academic but also from a practical standpoint.

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PRESIDENT'S ADDRESS.*

BY W. T. REEVES, D. D. S., CHICAGO, ILL.

The time honored custom of a President's address at the opening of a dental meeting or convention, I am going to side-step today. Usually such addresses consist of a lot of platitudes put in different phrases from what has been said before.

I remember well a paper of this kind that was delivered a few years ago at a state dental meeting I attended. I will not mention the State, for I have attended a good many different State dental society meetings in the past fifteen years. Evidently the whole year had been spent in preparing that paper, for it took over an hour to deliver and covered every phase of dentistry from A to Z.

*Read before the Northern Illinois Dental Society, October, 1913.

and the saying "There is nothing new under the sun," was verified. What meat there was in that address could have been picked out, boiled down and told in five minutes. If that had been done some good might have resulted; as it was, half of his audience had departed before he was two-thirds through (fortunately the entrance to the auditorium was in the rear.)

Occasionally there is a man who has a message to deliver, and if that message is delivered straight from the shoulder, results will follow, and a new movement will be inaugurated for the betterment of mankind, the end of which no man can see. No such inspiration has come to me during the past year, and following the resolution I made to myself while listening to the paper referred to—that if I was ever in a like position I would not inflict my audience with a lot of words that left nothing to be carried away. I will be brief.

This society has always prided itself on its good fellowship, in which freedom of speech was the keynote, and to keep up that good-fellowship and freedom of speech it never has employed a stenographer to take down the discussions, so that everyone could say what they pleased without fear of its being put into print to stare them in the face at some future time.

This society is unique in the way of dental societies in that it has always tried to keep itself a great big family of dentists, in which there were no outsiders, and good fellowship and harmony has been its watch-words, and freedom of speech the keynote. To promote full freedom of speech at this meeting I am going to start the ball rolling by presenting two subjects for discussion of every-day practice on which everyone can say something pro or con.

To preach a sermon one must have a text or to say something a subject to talk to—I might call it duty to our patients, or I might take the simple word Honesty,* only I do not wish to imply that there are any dishonest persons present. If I prick the conscience of anyone, that will show there must be some truth in what I say; let such a one defend himself from his viewpoint. All subjects have more than one viewpoint, and only good can come from a full and free presentation from all points of view.

During a practice of a little over twenty-two years, there

are two things that stand out above all others in my observation of work and mouths that have come under my care. They are lack of separation previous to restoring lost tooth substance by filling, and lack of scaling of tartar above and under the gums, in the so-called operation of cleaning teeth.

We will take up separation first:

The theory of contour fillings with proper contact points, that the teeth may keep their right relative position in the arch, and the interproximal space and the gum septum preserved intact, is scientifically correct. I believe you will all subscribe to this. If that is so why is it so few put it into practice? Are you doing your "Duty to your patients?" Or are you honest with your patients? If you fail in the slightest degree to preserve the normal size of the tooth in its normal position, in the jaw, and the normal interproximal space intact, I say NO. In looking back over twenty years, it is a sad commentary on dentistry to see how few operators have tried in the slightest degree to restore contour, position, and preserve the interproximal space. The rule has been a saw or file has been used between the teeth to make working space that has made flat surfaces on the teeth—fillings put in and finished that are what we call flat fillings, then the teeth close together, the flat surfaces touch and then all kinds of trouble begins. If a patient is under thirty years of age discomfort in mastication is the first and greatest trouble. If that was all, it would be enough to taboo such practice, but that is the least of the troubles. After thirty years of age graver and more serious troubles follow such practice, but why go on and enumerate them, you all know the results that follow such practice as well as I do. Every dentist knows, or should know, these A B C principles of our profession. Is there a dentist anywhere who would tolerate such work in his own mouth? Now then why should he do such work in his patients? The first answers that come are "lack of time to do separating," and "patients won't submit to coming and having wedges changed until proper space has been obtained," that "the patient comes to the office and wants a filling put in then and there." Every operator knows these are mere subterfuges or sops to his conscience. No dentist should allow a patient to dictate to him when, how, and with what he should fill a

tooth. Be a gentleman, control your practice—patients are intelligent and will appreciate a little time spent on your part explaining the whys and wherefores of what they have in their mouths—and what you aim to do in restoring their mouths to a sanitary and comfortable condition, then take the most flagrant case in that mouth and separate with wedges until you have regained the space that has been lost by repeated flat filling. Then make a fully contoured filling with perfect contact points and the result will speak for itself. The old saying “The proof of the pudding is in chewing the string” will prove true. That patient will be a life long advocate of yours and call you blessed.

I could spend an hour giving you facts from my practice to illustrate this, but one case will suffice for the time.

* * *

Some operators make a pretense of getting space at the time of the operation by use of a mechanical separator. You all know that at the best it is a mere subterfuge; that you have to stop before you get the space you would like, either from the pain produced or from fear of the damage that may result if you go any farther. Then you ease your conscience by saying you have done the best you could under the circumstances, but is that so? It would be a blessing to dentistry and patients if there had never been such a thing as a mechanical separator made.

CLEANING TEETH.

Now we come to the most flagrant abuse of all operations in dentistry. And why is this so? Is it because you are doing something for nothing, or is it because you say to yourself you don't like scavenger work and can make more money putting in gold fillings, gold inlays, porcelain inlays, crowns and bridge work? Is it the first doing something for nothing? To many operators I fear when they have finished up a mouth with fillings, etc., and the patient says, “Now, Doctor, you ought to clean my teeth,” you let him know that will be gratuitous—just as you get a pair of suspenders or a tie thrown in when you buy a suit of clothes—and you take brush or disk in the engine and go over the outer surfaces of the teeth and make them look nice. You who are doing something for nothing, are doing nothing for

your patient except doing him an injury. The patient trusts you and supposes when you have done that stunt of cleaning you have done all that is called for, and doesn't know any better until he falls into the hands of a conscientious dentist, or has a more or less extensive case of pyorrhea develop. In either case he will know that you have not been honest and conscientious in your service to him and the result will be disastrous to you. Something for nothing never pays—for nothing will be rendered for nothing received. If it is the second—that you look upon it as scavenger work, and can make more money in other lines, then you have missed the great professional spirit that should underly all your operations—for in scaling off the tartar serumal and salivary, polishing the necks of the teeth and treating the gums, you are doing true professional service. For when you do this work in a professional spirit you lift it from scavenger work to the realm of Oral Hygiene and Prophylaxis, and rendering the greatest service you can render a patient, better that you leave cavities unfilled than that you neglect the proper cleaning of the teeth. The patient knows about the cavities and will have them attended to, but he does not know whether you have done your whole duty when cleaning his teeth until too late, and you can get just as much for your time spent in cleaning his teeth as for any other operation when he knows the importance of the operation. There is one remark that has been made oftener than any other from a new patient—it is my custom when starting work for a new patient to clean their teeth first, so that I can watch the care they give their teeth during the time the other operations are going on. When I have finished the sitting the universal remark has been, "Doctor, I have never had my teeth cleaned that way before." A few incidents from practice to illustrate what I have said on cleaning and I will close this part of my paper and hope you one and all will jump in and rip me up and down the back, for the more you discuss, the merrier it will be.

* * *

A thought has grown on me during the last three months, that I believe if carried out will result in great good to the society—a change in the method of electing our officers. I believe if we chose the place for the next meeting first, and

then elect a President, Vice-President, Chairman on Program, Chairman on Clinic, Supervisor of Clinic from that town, they to select their own local committee, we would leave it then up to that city to give us a good meeting. The officers would be able to get together as often as needed to plan and lay out the work and carry it out. It would be team work from start to finish and team work is what gets there today.

A METHOD OF ELIMINATING THE ADVERTISING
DENTIST AND AT THE SAME TIME RAISING
THE STANDARD OF DENTAL WORK.*

BY DR. S. C. SIMS, STERLING, ILL.

We have heard a great deal in the recent past about the progressive man and progressive methods in politics. The term is applied to the man whom the people have appointed to serve or represent them and to the methods adopted by that man in his public service.

We, as members of the dental profession are servants of the public just as the members of all the professions are. We are paid by the public for this service. Now the questions on which this paper hinges is this, "Shall we, while rendering our service, use our professional knowledge for the good of the public as well as our own good, or shall we only regard self and adopt a method most conducive to our own convenience and let the public look out for themselves. Shall we be progressives of the Roosevelt type or stand patters of the old guard type?

What is necessary in order to insure a square deal in any business transaction if we leave out of consideration the honesty of the contracting parties? Is it not the ability of the party of the second part to judge of the merits of what he is buying as well as the same ability in the party of the first part to judge of what he is selling? It is only when this ability is lacking in one party that the other party is able to practice deception. In other words, deception necessarily calls for ignorance in the

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party, to be deceived. A man who knows little about horses would be a poor man to buy horses. Now, apply the same reasoning to dentistry—every dentist knows that to enable him to deceive the public the unscrupulous dentist depends on the ignorance of that public regarding the nature of the work he turns out. The chief argument of the advertising dentist, namely—painless dentistry, would cease to be an argument if the public knew that in order that a filling in a tooth may be efficient in the preservation of that tooth, that all the decay should be removed from beneath that filling and that in order to do this thoroughly in a live tooth, the dentist, however careful he may be must necessarily in a vast majority of cases, cause some pain. In other words, an educated public could not be so easily deceived and would know that in order to do painless dentistry the dentist must cease to remove decay as soon as there is pain, which every dentist knows to be a common method used by those who wish to pose as painless dentists.

In every walk of life education or the possession of knowledge sufficient to enable one to judge of the merit or reliability of a certain venture is the only safeguard against deception and the greatest factor in insuring a square deal. This degree of knowledge for the laity is difficult and sometimes impossible of attainment when applied to most of the service rendered by members of the profession. This is especially true of the medical profession. Life and its perplexing manifestations under the conditions of health and disease are more than the master minds in the medical profession can fathom, much less the laity. But even here a little more education might dispel the element of mystery that seems uppermost in the minds of some apparently otherwise intelligent beings regarding disease, for example, regarding the healing efficiency of putting a cold axe under the bed, or burning feathers, or measuring a child for short growth, etc.

However, in sickness the most intelligent of the laity must depend upon the honesty and skill of the physician and because the field of study that the conscientious physician is trying to master is often beyond the mind of man to master, it affords a fine field in which the charlatan can ply his trade unmolested and undetected. What I have just said of the medical profes-

sion may be applied in a more limited sense to the legal profession, but let us consider the dental profession. The field of study and preparation that the dentist must take up and try to master is similar to medicine as far as it goes, or as far as it affects that particular part of the human being—the oral cavity, and also as far as that particular part effects the whole. In other words, dentistry should be regarded as one of the branches of medicine. Like the physician, the dentist must diagnose and treat his patient and this diagnosis and treatment should be based upon a fund of knowledge which covers every agency which might have been causative in producing the abnormality which he is called upon to treat and also a thorough knowledge of every influence which this abnormality and the treatment of the same may exert upon the rest of the human economy.

Now, it is just as difficult or impossible for the laity to attain and intelligently apply the above knowledge as it would be for them to attain the knowledge referred to when speaking of the medical profession because it is practically the same in a more limited sense; but there is a part of the dentist's work, namely, the mechanical part, which the public can understand and of which it can, by a little education, be converted into a rather intelligent judge. But granting this to be possible you may ask why should we undertake to train the public mind so that it can detect the defects in the work we turn out? We can see how the public would be benefited, but where is our reward? Or is it all one-sided? We will see later on.

We all know that there exists in the mind of a great many of the common people the thought that their teeth are soft and will not hold fillings and that therefore it does not pay to have them filled. The only way that I can explain that thought is that it was started by some incompetent dentists of the stand pat variety who wanted to explain the failure of some of their poor work.

The Illinois State Dental Society is trying to inform the public regarding the deleterious effect of an unhealthy mouth upon the rest of the body, and also that the teeth will not decay if the mouth is kept in a healthy condition. We are thus developing in the minds of the public a desire to preserve the teeth; but if they still harbor the thought that their teeth are soft and

will not hold fillings, what will be the result? In order to keep the mouth sanitary they will either have their teeth crowned or extracted and that is just what the charlatans of the dental world want, namely, an opportunity to put on a cheap gold crown which stands out an eighth of an inch at the gum line but which will stay on until the tooth comes out and in the meantime be a fine culture field for disease germs, or failing in his effort to crown the tooth because of financial reasons, he will do the next best thing in the estimation of the patient and of the dentist's pocketbook, namely, extract the teeth and make a plate.

Now, unless we do our duty by educating him, the victim of the poorly fitted crown does not know that his tooth loosened and came out because of the ill fitting crown, nor does he know that his mouth was unsanitary during the whole life of the crowned tooth. If by a little education, we can instill into the mind of the public and especially the uneducated class of the public the knowledge that they do not seem to possess at present that there is a difference in the quality of dental work and that the quality of the teeth does not have nearly as much to do with successful dental work as does the quality of that work and especially the condition of the mouth, don't you think that more teeth would be filled that are now extracted or crowned with an ill-fitting four or five dollar crown by some advertising dentist?

It is reasonable to infer that when the public in general realize that high-class dental work is always satisfactory regardless of the quality of the teeth, provided, of course, that the mouth is kept clean and wholesome, there will be much more dental work done and the demand will be for good work with some ability on the part of the patient to judge whether the work is good.

Now, should this condition of affairs in the dental world as it applies to the public become a reality, I am sure it would be heartily welcomed by every conscientious progressive dentist and it would be the death knell of the advertising dental shark. I wonder if we all realize that the cause of the greatest harm done by the unscrupulous dentist, be he advertising or ethical, is the fact that he causes to develop in the indiscriminating

minds the thought that all dental work that has for its object the preservation of the teeth is unsatisfactory and does not pay.

The distrust of the dental profession that may grow in the minds of the medical profession owing to the unsanitary condition and influence of the average crown and bridge should be also cause for serious thought. The attack of Dr. Hunter of London as reported in *Current Literature* for August, 1911, is indiscriminating and unjust because it is indiscriminating, but will not the medical profession have cause to agree in a large measure with Dr. Hunter when upon examination the majority of crowns and bridges we see today are found to be unsanitary? How shall we correct this condition? I see no more effectual way of raising the standard of dental work than by creating a discriminating public which can demand better dental work because it can recognize such work when it sees it, and the dentist who cannot produce the goods will soon have no goods to produce.

I think we will all agree that some education of the public along this line would be beneficial to all concerned except to the advertising and unscrupulous dentist, but how shall we accomplish it most effectively? I think every dentist should be prepared to explain and illustrate by sketches and models the deleterious influence of a poorly fitted shell crown without contour, and of an improperly constructed bridge. It seems that I spend one-fourth of my time in efforts along this line. And, by the way, I might say right here that I have practically cut out the shell crown because of the ledge of gold under the gum line even when perfectly fitted. It has been a number of years since I have made a shell crown, preferring the cast gold crown that does not lap, held in with pins. Only in some few cases of bridges where the stress is especially strong I make the cast abutments lap a little over the occlusal surface.

But to return to my subject, the time thus spent by the dentist in his educational effort is well spent but he only has an audience of one and he does not reach the people who do not come to his office and they are the very people that need the instruction the most. Then I have often thought that the patient might think that I am only exploiting some pet theory of mine or trying to impress upon him my greater knowledge and skill to the detriment of my professional brothers.

It seems to me that this educational effort can be conducted more effectually by the Illinois State Dental Society through the medium of the newspapers and magazines. The class of people whom the dentist does not reach, would thus be reached, and coming from the State society the instruction would have a greater weight of influence. I understand the State society has covered this phase of dental instruction in the series of articles prepared for publication in newspapers. I have written to Dr. Warner, Chairman of the Press Committee, for a copy of the articles in this series bearing on this subject and also to find out how extensively they were published by the newspapers of the State. But up to the time of finishing my paper I had not received a reply. I understand many of the papers refused to publish the series of articles, claiming it was an attempt to get free advertising. Now, of course, we can all see that the ultimate aim of the publication of these articles is to get the public to care for the health of the mouth and in so doing more dental work will have to be done and the dental profession will profit by it. So we see that from a mere business standpoint the newspapers have ground for their argument.

Now with the phase of dental education of the public referred to in my paper if handled properly, we could not be accused of an attempt to increase business and get free advertising, but it could be presented for what it is, namely, an attempt to raise the standard of dental work and free the dental profession of the stigma cast upon it by such men as Dr. Hunter, due to the poor quality of dental work that is so frequently inflicted upon the uneducated public, and these articles will be read with more interest and exert a greater influence because of the lack of a mercenary motive to prompt their publication, although the result as I have shown in my paper will be to the financial welfare of the dentists as well as to his professional welfare.

Of course, in these articles no reference should be made to advertising dentists as such because the newspapers might refuse to publish anything which would discriminate against the advertising dentist from whom they received financial remuneration. Judging from a conversation with the manager of one of our local papers, I think articles of this nature would be gladly published by all newspapers and all the important facts

regarding the sanitary conditions of the mouth and its relation to many diseases of the body would almost necessarily be brought out in these articles. The subject might be all covered in one article issued by the State society and so stated in the head lines of the article. It should if possible be a leading article occupying the first page with prominent headlines. Such an article on the front page of the *Chicago Tribune* and other prominent State papers would be widely read and talked about. I do not know if the press committee has had published in any of the Chicago papers their series of articles. If so, they have not been able to get them sufficiently prominent to attract attention, because only one Sterling dentist remembered of reading any article in any of the papers dealing with the care of the teeth and this was in the *Sunday Tribune*. He did not know whether the articles were put out by the State society or not.

Now, it seems to me that just one leading article as mentioned above would do more good than many articles, especially if it was stated in the head line that the great Illinois State Dental Society was back of it.

It seems almost unnecessary for me to suggest the subject matter of this article or articles. Perhaps the subject is well covered by the articles put out by the Press Committee.* Take for example the shell crown. The people could be instructed to examine the natural tooth, the importance and function of the buccal and lingual contours could be explained and illustrated and the necessity that these contours be reproduced in the shell crown in order to protect the gum. The necessity for removing the contours in fitting the crown could be shown in order that the crown sets tightly to the tooth at the gum line. It would be an easy matter for anyone possessing a shell crown in his own mouth to tell if it fit closely to the tooth all around at the gum line, whether it possessed the contour referred to and touched the adjoining tooth leaving the interproximal space. Something could be inserted that would help to stop the common practice of placing a gold crown over a tooth that perhaps has only a

*Since writing this paper I have received a letter from Dr. Warner of the Press Committee who forwarded me copies of the articles furnished by his committee for newspaper publication. I was surprised to find that no reference was made in any of these articles to the educational matter referred to in my paper.

comparatively small proximal cavity in it which would much better be filled, that is, much better for the patient but not for the pocketbook of the dentist. The importance of a smooth and perfect joint between filling and tooth especially at the gingival line could be stated and illustrated. The importance of removing all decay regardless of pain or the danger of exposing the pulp, could be shown and the dead pulp, and abscessed tooth and early dropping out of the filling could be shown as a result of not removing all decay.

The value of extension for prevention when justifiable and the reason it makes future decay less liable might be explained. The points on the teeth most liable to decay might be shown and reasons given for the tendency to decay at these points. The deleterious influence of calculus especially under the gum line and between the teeth could be shown and the necessity of a thorough removal of all this when the teeth are clean to insure a healthy condition of the gums and mouth.

It may be that I am going a few points further than some may deem advisable. This thing of taking the public into our confidence, of teaching them the tricks of our trade, you say, is going a step too far, but will it not help to insure a square deal to the other party of the contract and advance the purpose for which this paper was written? It would surely put a greater premium on good dental work than it possesses at present. You may say that a patient should not go to a dentist whom he could not trust, because, regardless of education, he will have to trust him anyhow regarding many things; then why develop in the minds of the patients a spirit of criticism and distrust which may be very annoying to the conscientious dentist. Would it not be a case of a little learning being a dangerous thing? It is true that the patient should trust the dentist whom he employs, but why not help him to more intelligently judge as to whom he should trust as his dentist by making him a better judge of dental work?

It is also true that a spirit of criticism and distrust may be annoying, especially when founded upon very limited knowledge. It would surely be annoying if the criticism were justly applied to some of the dentists' own work. In that case, if the dentist is true metal, if he is a true progressive he will try and do jus-

tice to his employer. If the criticism is unjust or misapplied it calls for explanation and more instruction from the dentist which I think any dentist should be willing to give for the good of the cause. One thing I am sure of—this spirit of criticism would be exceedingly annoying to an unscrupulous dentist and if he did not handle it properly and mend his ways it might result in making him change his vocation.

Such education of the public would enable the patient to determine whether the dentist who cleans teeth for One Dollar has given his teeth a good cleaning or only given them One Dollar's worth of cleaning—the latter is usually the case and with the present degree of dental education among the laity, the dentist is the only judge of what constitutes One Dollar's worth of cleaning. No doubt you have all had the experience of cleaning teeth that the possessor claimed were given a good cleaning by Dr. So and So, perhaps six months ago and you know from the adamant consistency of the deposits and the great difficulty experienced in removing them that they have more probably been present on the tooth six years rather than only six months. You will doubtless find upon inquiry that the work was done six months ago by a One Dollar man. I have a shell crown here that I would like you to examine—not because it is so exceptional that you have not all seen one like it—but because it is illustrative of the subject. This crowned tooth I extracted from the mouth of a traveling salesman who said that the dentist to whom he had been referred by a customer had not consumed half an hour in constructing and fitting it. Had this gentleman whom I know was no bargain hunter, been possessed of even a small amount of dental education, such as I am referring to in my paper, that dentist would not have been permitted to set a crown like the one you are looking at and his knowledge would doubtless have enabled him to have obtained proper treatment of the tooth and thereby preserved it.

Yes, I am sure that a little education along this line would make the way of the transgressor in the dental profession harder than it is at present, and would raise the standard of all dental work. It would put us all on our metal. There is no dentist who has his heart in his work who takes a pride in the quality of the work he turns out, that does not like to work for a discrim-

inating patient. It would be an extra incentive to the dentist to do his best if he felt that his patient was capable of appreciating the quality of his work and would thus place him above the mediocre class of dentists. And another thing, this extra effort on the part of the dentist to do his best would certainly result in greater efficiency and better work.

DISCUSSION BY DR. BIGLOW:

Dr. Sims' paper is progressive, and his hope of eliminating the quack by superior workmanship is a noble idea, and every dentist should do his best to bring this to pass.

Educating the public is always slow, and to educate it so that it will know when it has received only the best in dentistry is questionable, as the public who is receiving dental services is a very cosmopolitan mass. Many are not educated in other ways; some are looking for the painless dentist; and some for the cheapest. Many times it takes more than workmanship to prove to such that the advertiser is not the best dentist.

The essayist suggests newspaper articles. The average daily newspaper has done little or nothing for the professional dentist or physician, and what can we hope from the papers that are publishing these deceitful and misleading dental ads? The publishers are in the same class as these advertisers. It is dollars in their pockets; no matter what the public receives. If the papers would not publish these untruthful statements, what chance would the advertising quack have of getting business? The advertiser is quick to take advantage of any word, term, or idea; e. g., "Teeth without plates," "The alveolar method."

A few years ago when the Illinois Medical Society met in Rockford, Dr. Ridlon was present and gave a clinic. The local daily papers praised him and had much to say about "bloodless surgery." The next few days following, well written ads appeared in these papers stating that a certain doctor in Rockford had been doing "bloodless surgery" for some years and was meeting with wonderful success. That doctor was only an advertising osteopath.

Better ways to help the public to understand the truth

about dentistry are examination of the teeth of the school children in the public schools, public lectures, talks at the dental chair, and tracts and booklets. Every town large enough to have a graded school should have a free clinic for the school children.

It seems to me this Northern Illinois Dental Society and our state society, as well as all other such organizations, are missing golden opportunities by not holding one public session at each meeting, for the benefit of the citizens in the city in which they meet. The physicians, the nurses, the school teachers and the school children should be given special invitation to attend a popular and helpful lecture on dentistry, which should be a part of the programme at every dental meeting.

DR. ARTHUR C. WILLMAN:

I believe that this paper deals with a very live question and with the essayist I feel that something should be done.

There is no question but that a great deal of harm is done by bad dental work, not only to the teeth, but to the health of patients. The advertising sharks are with us, but we also have with us a great number of non-advertisers who are not conscientious, neither are they skillful, and their work is no better than that of the advertiser. The fact is we live in a glass house. We hear a great deal about good dentistry, but the real article is comparatively rare. What are we going to do about it?

The proposal to have an article or series of articles prominently featured in the leading papers would no doubt help. The state society has done some work along this line. In our city the dentists all contributed to have the articles printed in our local papers, so there could be no complaint that we were getting free advertising.

But, after all, "Example is better than precept." We must demonstrate to the public that we have something better. The best argument that a board is crooked is to place a straight one alongside of it. And the best argument against bad dentistry. It may be slow work, but it will win in the end. If all our patients are living examples of good dentistry they will go out and be our missionaries.

SOME OBSERVATIONS OF ORAL ABNORMALITIES AND THEIR RELATION TO MEDICINE AND SURGERY.*

BY M. N. FEDERSPIEL, B. S., D. D. S., M. D.

Professor of Oral Surgery & Orthodontics, Marquette University, Milwaukee, Wisconsin.

I fully appreciate that my position as the essayist of the evening demands much in the light of recent development in the science of dentistry. But when we consider the voluminous work that has been done in the past—when we trace the evolutionary progress from empirical methods to that of an almost exact science—I am ready to confess that my paper this evening may fall short in bringing to you ideas that are not in advance of what you as a scientific body of men already possess.

Medicine and dentistry have been most closely associated since the very earliest time; in fact, down to the seventeenth century dentistry was practised almost exclusively by physicians. Later it was practised by men who had not been trained as physicians or surgeons and their numbers have gradually increased up to the present time. This is in itself a matter of regret, but what is certainly far more to be regretted is that, in a similar manner interest in the teeth and jaws on the part of physicians and surgeons has gradually diminished. Dentistry therefore, ignorant of the advance in medicine, has drifted along fighting its own battles while medicine, on the other hand, has progressed with a corresponding ignorance of the accomplishments in dentistry.

Strange as it may seem, the connecting link between medicine and dentistry seems wanting. This, I believe, is due to the fact that our great medical schools with their A. and A. plus rating, spending thousands and tens of thousands of dollars in medical education and woefully neglect to bring home to the medical student the importance of recognizing oral diseases and deformities.

*Read before the St. Louis Dental Society, Oct. 14, 1913, St. Louis, Mo.

The literature of the medical profession is but a proof of the gross ignorance shown by some of the most learned medical scientists when they are forced to speak on dental topics. Beyond the term pyorrhea, alveolar abscess, gumboil, etc., they little comprehend the meaning of dentistry. To them it is a tooth carpenter trade.

I do not wish to imply that the medical profession is not progressive—far be it from that—I fully realize that the day of the bewhiskered, dignified family doctor with horse and buggy competing with midwife on the trail of the stork is fading into twilight. Thus one of God's great blessings at a time when science was shackled with the chains of superstition and locked with the key of hypocrisy has passed away. But unmindful of the past and worshiping at the altar of truth, science has freed itself from the darkness of superstition and is fast traveling towards the goal of sunshine, where truth reaches to the four winds of heaven. It is well for us to listen to the stories of the past, and of the lives of great men who have left footprints on the sands of time. May we not well profit by the mistakes of our forefathers printing on our minds the facts which they have molded from the crude methods of by-gone days?

What remarkable advancement has been made within the last twenty-five years! Looking back over this period of time can you not see disease in its various forms, stalking in broad daylight on the streets of cities and hamlets; can you not see it in the highways and byways of our fair land? Its price was the lives of thousands, regardless of sex, color and religion. Unlike the criminal or thief, it unlocked no door nor opened a window. It left parents without children and children without parents. The stigma of its devilishness was left on the crippled and blind. Then it would relapse into sleep only to be awakened by the cry of the new born to satisfy its hunger by sacrificing humanity on the altar of sorrow and grief.

I am satisfied—and you will agree with me—when I say that within the last ten years no profession has developed with such remarkable achievements, nor offers so much to humanity, as has the dental profession. You must also admit that no profession receives so little compensation for its highest skill as does the dental profession. This, gentlemen, is no fault of the

public. It is due only to the neglect to teach the world that dentistry stands for something higher and better than the reckless sacrificing of teeth by the slight of hand performance or the crude and unscientific methods of treating and filling tooth cavities. Dentistry will never come into its own until we produce convincing proof that the practice of our profession plays an important factor in giving the patient a direct result of systematic improvement.

Turning back the pages of history one cannot help admiring, almost with a sense of sacredness, the work of pioneers who have forged dental ideas from empirical methods to that of an exact science. Let us regard Flagg, Garretson, Kingsley, Miller and many others as the pillars upon which our success depended. It is fortunate that in all walks of life we find men, here, there and everywhere, whose sacrifice of money, time and health, has been the stimulant of slow and progressive growth. The spirit of such men remains with us when we comprehend, in reading their biographies, the trials and tribulations they endured in blazing the way through a forest of dental ignorance. That the growth of dentistry owes much to such men cannot be questioned; but we must not forget that while our profession with its large army of workers is rendering splendid service to humanity throughout the entire world, its accomplishments, its results, its deeds, can be improved to a great extent. In other words, the methods of today, practised by the majority of dentists, are speculative.

It is almost pathetic to see so many students graduated from the best dental schools in this and foreign countries leave their Alma Mater the proud possessors of a diploma and then spend their lives within their four walls, the door closed against the onward, though slow, progressive march of dental education. Dental journals, if they have any, are never read. They have no dental books. Dental meetings are rarely attended. Is it, then, any wonder that such men sooner or later fall by the wayside and drift into methods and ideas that are reckless and dangerous to the community wherein they practice?

Why all this? The answer is Dental Provincialism.

Not long ago I had the pleasure of spending a few hours chatting with a man who spent many years at the chair and

whose patients numbered thousands. His hair was white, his eyes dim, age was creeping upon him, and as the light from the window fell upon his face it seemed to reveal a picture that reminded one of the old philosopher of fiction. He, too, was a dentist, and he took delight in telling me that he was one of the old school. He had never attended a dental college. It did not take me long, however, to realize that that gray-haired old man had been and is still a student. His knowledge of embryology, anatomy, physics, chemistry, diagnosis, treatment and prognosis, together with up-to-date dental technic would put a young graduate to shame in any competitive examination. This old fellow had for years read and mastered journals and books. He rarely missed dental meetings. Is it any wonder that he should have developed within him a knowledge of the highest form of dental education? More than that, he was also thoroughly informed in the work of dental scientists of other lands. Gentlemen, here was a man who never attended a dental school, who received his early training in a dental office, yet through love of his work developed into a true scientist and who used his spare time in study and reading the works of dentists throughout the entire world. This one case alone demonstrates the importance of men freeing themselves from the shackles of dental provincialism. What a contrast to the man who gives three years to a dental school, where he has every opportunity to become familiar with modern science—graduates with honors—and then after a few years forgets or ignores the latest methods of dental science. Such are the very men who prostitute and commercialize a profession, who, through procrastination and ignorance, make their offices a bargain counter to cover their dishonest methods with the cloak of dental ethics.

And this is no dream. Go to any large city and you will find commercialized dentistry flourishing in the down town districts. At the door you will usually meet a colored gentleman fashioned in the garb of a pageant idol. He ushers you into a parlor where quackery is practised according to the findings in a patient's purse. Let me remind you that while such advertisers do not hesitate to play in the open, there is still another type of dentist, who, under the guise of an ethical practitioner, preys upon his patients' imaginations and at times succeeds in

making the unfortunate victim believe that he is suffering from a special affliction which can be cured by a special method, known only to himself.

Not long ago a young man reported at my office with the complaint that he had two loose upper centrals. He informed me that the pulps were at one time gangrenous—that a dentist in another city had treated and filled the root canals. A year later he noticed the teeth a trifle sore and beginning to become loose. He called on a dentist, who informed him that he was beginning to have a disease called pyorrhea, and unless he yielded to immediate treatment he would lose all his teeth; that it would take about twenty-five half-hour sittings and his charges would be \$5.00 a visit. The young man doubted the diagnosis, called on another dentist, who referred him to me. Examination showed a splendid set of teeth. The mouth was clean and healthy looking, no evidence of pus anywhere. The centrals upon percussion and palpation were a trifle loose and sore. Now, gentlemen, what I am getting at is this. The dentist who informed the patient he had pyorrhea was either ignorant of the patient's condition or made an attempt to flim-flam the patient out of a hundred or more dollars. Of course, pyorrhea in such a mouth can be cured, because there was no pyorrhea. Now let us get back to the patient.

1st. The history—Gangrenous pulp, treated and filled.

2nd. Teeth trifle loose and sore.

3rd. Some fluctuation in the alveolar apices of the sore teeth.

4th. No pus—no fever—health good.

Diagnosis—Possibly an epithelial granuloma which became a cyst at ends of roots producing absorption of bone. X-ray picture showed that the root canals were well filled with destruction of bone at the end of each root. The treatment was surgical and the prognosis favorable and the fourth day he was discharged cured. Now, I do not wish to go into the subject of treatment, but I want to point out the danger of patients being in the hands of men who measure their profession as a buy and sell proposition. Neither do I wish to convey the idea that I belittle oral hygiene. I am a firm believer in the old adage that cleanliness comes next to godliness. But in this

day of enthusiasm about mouth prophylaxis, many members of the profession are losing sight of the principles underlying the production of disease.

The subject of so-called pyorrhea seems to have inspired the dental profession to such a height of enthusiasm that our societies spend hours in its discussion and journals devote pages to its treatment. Are we to believe that the mouth harbors one disease? Are we to believe that loose teeth are always caused by pyorrhea? Are we to believe that mouth diseases are always primary? Are we to forget that many diseases of the mouth are secondary? If such is the consensus of opinion, then we have not as yet passed beyond a speculative profession. Not a day passes but one hears of some layman who is led to believe he has pyorrhea. Fake dental parlors advertise its cure. Men high in the profession sing its song and proudly boast of the fees they get. Thus we are in the height of frenzied pyorrhea delusion.

Let me remind you that pyorrhea misrepresentation is not the only stain on the dress of our profession. I cannot help but voice my cry against another field of abuse which is already moving with the marvelous rapidity of gross insult to the fundamental principles of an almost exact science. A science which within two decades has produced results enough to satisfy the extreme pessimist relative to its wonderful possibilities. I refer to Orthodontics.

Strange as it may seem that though this specialty has contributed volumes to dental literature regarding its methods of diagnosis, treatment, and prognosis, it has failed miserably in being immune to Orthodontic abuses. Its field is already invaded by the so-called *Orthodontic mail order laboratory specialist* who tempts the dental practitioners to regulate irregularities of the teeth with appliances fitted to crude models, regardless of conditions which necessitate the extreme care in obtaining a comprehensive understanding of the etiology, diagnosis and prognosis. Such methods cannot help but sow the seed of discontent among practitioners and thus retard the teachings of true Orthodontic knowledge.

I have often wondered why it is that dentists seem to neglect the principles regarding modern methods in diagnosing.

Stomatology is no different from other specialties of medicine yet it is far from being practised along lines that are truly scientific. While it is true that from a mechanical standpoint it is regarded as having achieved high standing, it must be classed as dealing with the effect. In other words, it is a reparative process which artificially restores to a certain extent the force of mastication. But that alone, gentlemen, does not remove or cure the cause. With our knowledge of bacteriology, pathology, chemistry, physiology, anatomy, etc., and I might further add, with our knowledge of the symptomology regarding certain diseases effecting the mouth and their relation to systemic conditions, it is fitting and proper that we should strive to familiarize ourselves with the causative factors of diseases. Then, too, if we may not always understand the etiology we should at least be familiar with the pathological conditions as to how and when and where the disease ends. In other words, we should understand the gross and microscopic changes that take place during the progress of disease. With such an understanding we can prognosticate. For that completes diagnosing treatment.

A thorough examination of the mouth by all available methods is of great value, not only in the study of disease localized in or confined to the oral cavity, but also in the investigation of general morbid states. It is wrong for a dentist to confine his attention to the teeth only. A proper study of the oral cavity comprises inspection of the lips, gums, teeth, tongue, floor of the mouth, salivary glands, the mucous membrane, the relation of the inclined planes when the jaws occlude, etc.

The oral cavity, being a part of the human anatomy, must be studied in its relation to the general system. Changes in the mouth due to general disease are not uncommon—in fact, they offer many times, valuable symptoms as an aid in rendering a complete diagnosis. Thus, for instance, in typhoid fever, the changes consist in ulceration, usually on the anterior faucial pillar, on the tongue, uvula, cheeks, lips and labiogingival folds. In diabetes the tongue is large, red (beefy), its margin fissured, the mouth unhealthy looking and frequently complicated by a suppurative alveolar periodontitis. The support of the teeth undergoes degenerative changes; the nutrition is lowered with

pus pockets harboring pathogenic germs. Such a clinical picture of the mouth with the finding of sugar in the urine should always be diagnosed as diabetic gangrene of the mouth. The treatment in such cases is palliative. Patients with such a disease should not be encouraged or assured that a cure be made with the much advertised pyorrhea instruments, pyorrhea vaccine, pyorrhea pastes. Oral prophylaxis with systemic treatment as palliative treatment, is fitting and proper. The prognosis in these cases is usually unfavorable.

The Lips.—In a healthy person the lips are of a bright red color, very lightly wrinkled. The thickness of the lips varies in individuals. This is also true of the amount of redness exposed. Changes in the lips and mucous membrane are very common and of much clinical interest. Cyanotic or blue lips are due to exposure to cold, in asphyxia, pneumonia, heart disease and some forms of intestinal toxemia. Pale lips are found in anemia, hemorrhage, chronic parenchymatous nephritis and aortic stenosis. In diabetes there is usually found a striking redness of the lips. In jaundice a yellowish tinge. In lead poisoning the blue line along the gums and the patches on the inside of the lips. Brownish patches on the palate, lips, and cheek is a diagnostic sign in Addisons disease. Observation of the lips and their changes during sickness offers many times valuable aid as a diagnosis.

Offensive Breath.—The dentist should be encouraged to be familiar in recognizing the causes of offensive breath. Among the causes of this condition are: Lack of mouth cleansing, loose and poorly fitted crowns and fillings; diseases of the antrum, tonsillitis, local diseases of the mouth and caries of the teeth. The odor which resembles the smell of dried and decomposing blood or cadaverous is sufficient reason to suspect cirrhoses of the liver. It is said to be due to a failure of the antitoxic function of the liver and the consequent passage into the blood of poisons generated in the alimentary canal.

A sweetish breath is very common in diabetes. The odor is like the smell of an over-ripe apple. A urinous odor is found in urameia. An offensive breath causes suspicion of carcinoma of the larynx, bronchitis, abscess and gangrene of the lungs.

The treatment of course depends on the cause; I merely

want to call your attention to the point that an offensive breath should be considered as a factor in making a diagnosis.

Time does not permit me to give a detailed report of the changes in the mouth due to general disease. Typhoid fever, uremia, pernicious anemia, scurvy, locomotor ataxia and skin affection such as urticaria, psoriasis, etc., oftentimes show abnormal conditions in the oral cavity, and the dentist should recognize these when called upon for a diagnosis.

While systemic conditions are responsible for many oral changes there are many diseases of the mouth which are primary. Still the classification of oral diseases is a difficult one. For instance, the various forms of acute and, I might add, many chronic inflammations of the mouth show that while the etiology differs the clinical picture shows striking similarity. Right here I want to call your attention to two cases which were admitted to my clinic at the Marquette University Dental School.

Mr. L., twenty-seven years of age; occupation, locomotive fireman; complaint, sore, loose teeth; habits, fair; urinary analysis negative; headache, considerable; loss of hair, yes; specific history, doubtful; blood pressure, normal; serum diagnosis, positive Wasserman; lower and upper teeth loose, with gums swollen and angry looking, **gums painful to touch**, some discharge of pus from sockets, gums bleed easily, breath foul; posterior teeth firm; diagnosis, syphilis producing suppurative alveolar periodontitis; prognosis favorable. Treatment, salvarsan, intravenously, and curetment of teeth, with usual prophylactic treatment. Result, cured.

Mr. J., sixty-five years of age; occupation, cobbler; complaint, sore, loose teeth; habits, heavy drinker; urinary analysis, albumin and sugar; headache, considerable; loss of hair, none; specific history, none; blood pressure, high; serum diagnosis, negative Wasserman; teeth loose in both arches, anterior teeth very loose, with considerable pus discharging from sockets; gums gangrenous and bleeding easily, breath foul and unhealthy looking palate, reddened and swollen; diagnosis, arterial sclerosis with interstitial nephritis, and diabetic gangrene of the mouth. prognosis, unfavorable. Treatment, palliative. Result, patient died of diabetic **coma**.

These two interesting cases should demonstrate the importance of having a thorough understanding of the etiology, diagnosis, prognosis and treatment of diseases and deformities of the oral cavity. Strange as it may seem, these two patients were under the care of dentists, yet at no time was an attempt made to find the real cause of the suppurative inflammatory condition of their jaws. In the young man, syphilis was a factor in causing his trouble in the mouth. In the old man, a complication of diabetes, nephritis, and arterial sclerosis produced the suppurative condition. No one could expect to cure these cases with scalers, brush and pumice-stone. Yet, strange as it may seem, the young man had consulted a number of dentists and each time was informed that he had pyorrhea.

The literature relative to the various forms of stomatitis, both acute and chronic, does not give the reader much valuable information in making a differential diagnosis. I am satisfied that many diseases of the mouth can best be diagnosed by studying the patient's general condition. Thus, for instance, in diabetic gangrene of the mouth, or so-called diabetic stomatitis, it is necessary to have a comprehensive understanding regarding the patient's general health. In syphilitic stomatitis local diagnosis offers little value. Serum diagnosis with the microscopical finding of the spirochaeta pallida tells the story. In stomatitis mercurialis, local diagnosis offers little help. Due regard for the etiology and removal of the cause with local prophylaxis usually offers a cure.

Gonorrheal stomatitis is uncommon. I had two patients under my care wherein the gonococci was found in the mucopurulent secretion. In these cases I found the mucous membrane swollen with a number of ulcerations on the gingival margin of the molar teeth. The teeth were loose and pus oozing from the sockets. Through cleansing of the mouth with continuous swabbing of the pus pockets with 50% argyrol every hour gave prompt relief.

While much can be said in regard to the different diseases both primary and secondary we should always remember that the mouth is the constant habitat of many bacteria, by far the largest number of which are harmless saprophytes. But there are some that possess pathogenic properties, which they dis-

play, either in the mouth or elsewhere when suitable conditions obtain. So it is well for the dental profession to teach the world that decay of the teeth, putrescent root canals, the various forms of stomatitis, etc., may bring on a disease at a distance from the original source—either by absorption of toxins and bacteria in the blood stream or by the swallowing of pus containing toxins and bacteria.

My remarks thus far have dealt largely with diseases of the mouth and their relation to health. Before concluding, however, I want to remind you of another phase in dentistry which is a powerful factor in giving to the human anatomy a direct benefit. I refer to the forces of mastication. The value of any organ depends on the function it performs. In the infant we find that the jaws, as far as mastication is concerned, have little or no function. At that time the child subsists entirely on milk. When the period of eruption begins the function of mastication simultaneously develops, so by the time the teeth occupy a normal relation of the inclined planes, the forces of mastication are at their height. The degree of deviation from normal development of dental apparatus robs the human anatomy of a certain amount of function. It is therefore logical to assume that the greatest of dental function depends entirely on the highest type of normal development. The normal relation of the inclined planes of all the teeth, when the jaws are closed, together with the normal movement of the temporo-mandibular articulation is nature's ideal mouth.

It is indeed strange that notwithstanding the phenomenal work done by scientists relative to a thorough understanding of oral deformities, that the recognition of a malocclusion is so much neglected in the diagnosing of human ailments.

Not long ago, a young boy—R. M., age 13 years, complained of stomach distress. He consulted an eminent diagnostician who pronounced the case hyperacidity with dilation of the stomach. Notwithstanding the usual treatment the boy failed to improve. By chance I happened to meet this patient and being informed of the boy's ailment was much interested as to how much function he displayed with his dental organs. Upon examination I found that the patient had a malformed mandible which had developed at an obtuse angle, permitting only the

second molars to occlude, while all the teeth anterior to these molars failed to close within an inch and a half. You can readily understand why this young patient complained of gastric disturbances; but, it is hard to understand why such an eminent diagnostician should blunder in ignoring the function of the oral cavity. I had a consultation with the diagnostician and called his attention to the faulty development of the mandible and the inability of the boy to masticate his food thoroughly. His answer was, "I never thought of it. I knew the boy had a splendid set of teeth, but I did not realize that the relation of the inclined planes meant so much in triturating and masticating food."

The stress of mastication in individuals having a normal relation of teeth may exceed 250 lbs. And in people whose diet is a soft one the maximum pressure may be as low as 50 lbs. But in individuals who have malocclusion the stress of mastication is decreased in proportion to the degree of faulty occlusion. What effect malocclusion of the teeth complicated by a diseased mouth has on the general system I am unable to say, nevertheless, I am sure that you will agree with me that when individuals possess a faulty masticatory apparatus it is the result of an abominable manner in eating, of bolting food, of flushing the stomach with so-called predigested foods, sloppy cereals and other slushy substances; of copious draughts of sugar and, therefore, fermentable coffee, tea, cocoa, etc.

This manner of eating is detrimental in two ways. In the first place food bolted in this way ferments in the stomach, and in the second place the disuse of the teeth causes their deterioration directly. These two factors, acids and disuse, combine to make a quality of teeth which in their worthlessness have never been equaled by any civilized or savage people in the history of the world.

While decay of the teeth is largely responsible for suppurative conditions of the oral cavity, and dental caries is in a large measure due to errors of diet, it is admitted that irregularities in the position of the teeth, in the direction of crowding, lead to an increase in diseases of the oral cavity.

It is between the ages of four and twelve years that the jaws fail to develop normally. This may be brought about through

many etiological factors. And right here I want to impress upon your mind that it is of the highest importance that in order to prognosticate malocclusion as well as to treat the teeth, you must understand the etiology of malocclusion, as well as to recognize it when it first begins to manifest itself. The advice usually given to a patient that the treatment of malocclusion should be deferred until all of the teeth have erupted is sufficient proof that he who gives the advice knows little of the fundamental principles regarding the science.

Much as I should like, time does not permit me to go any further in my observations of oral abnormalities and their relation to systemic conditions. You will agree with me, however, that diseases and deformities, of the mouth and jaws, are responsible for many of the ills that flesh is heir to. Pickerill sums it up as follows:

"It is perhaps agreed that 'bad teeth cause indigestion,' and that is as far as the sequence of events is followed. This is bad enough in itself, for how can it be hoped to rear a nation of mentally and physically strong individuals if, during the period of growth and development, there is the slow, insidious, but nevertheless sure, chronic septicemia brought about by the constant injection of toxins, pus, and bacteria, from a mouth containing numerous suppuration foci. It must be recognized too, by the public that anemias of severe type are frequently induced in the same manner; that tubercular glands of the neck, serious forms of Ludvig's angina, frequently fatal, are also caused by diseased teeth; that malignant disease (cancer) of the jaws, tongue, and lips, often originates solely from diseased teeth, and from this cause alone a large number of lives are lost annually; that a large number of disorders of the adjacent parts—i. e., muscles, bones, nose, eyes, and ears, are intimately associated with diseased teeth, either reflexly through the nerves or by direct extension of the morbid process; that in conditions of unstable cerebral equilibrium the presence of diseased teeth is frequently sufficient to excite an attack of nervous disease, such as epilepsy, tic (spasms), hysteria, and some forms of insanity; that, in addition to all these ills, of which large numbers of cases have been, and are constantly being recorded, there is a chronic lassitude, lack of appetite, mild headache, constipation, and an inability to per-

form a normal amount of work, almost invariably associated with extensive dental disease. It is this relationship between cause and effect which requires to be driven home in the public mind. The disease itself is not always obvious, and the channels by which its effects spread are not recognized."

Society considers it a waste of public expenditure to have children's teeth examined and treated, necessary as they are to triturate and properly prepare the food for its initiation in the alimentary canal, notwithstanding that the welfare of the people depends upon the health of the coming generation. This can be brought about only by the state. It should see that every child develops a strong body and healthy mind. A leading Chicago periodical made the statement that in one juvenile asylum, ninety-four children out of every hundred had defective teeth, and that every one of them showed evidence of malnutrition. This means an ill nourished body. Is it then any wonder to the student of sociology that our poor houses filled with paupers, our prisons with criminals and our asylums with feeble minded, is the outcome of society's neglect in providing for the child's needs? Yet society will spend thousands of dollars to send criminals to the penitentiary or to eternity. It will spend thousands and tens of thousands to banquet the hero of a victorious army or the nobility of Europe. It will spend lavishly for entertainments but little is given to fight disease.

Education plays little part in developing the career of the child when his physical welfare is neglected. But in this age of civilization when the majority of American homes eke miserable existence, the question of dental abnormalities is neglected. This is not due entirely to ignorance but to the individual problem of existence. Go to the great cities and you will find thousands and thousands of children going to school hungry, sadly neglected in body and mind. In the mines and cotton mills there are children who are old before their bodies have developed. Instead of enjoying ideal conditions so essential to the development of their bodies, they are dwarfed and stunted for profit. The problem that frequently confronts us today is, "How to rear a race of people so developed that their bodies need little medical and dental attention?"

THE CARE AND PRESERVATION OF CHILDREN'S
TEETH.*

BY JOHN F. STEPHAN, D. D. S., CLEVELAND, OHIO.

At what time or how early in the life of the child does our responsibility as a profession begin, in the care and preservation of its teeth?

As time goes by, it has been most forcibly brought to my mind that supervision cannot begin too early. When we remember that the development of the deciduous teeth begins about the seventh or eighth week of foetal life, and that calcification of the crown of the first permanent molar is well under way at birth, it will be clear that supervision might very well be extended to advice and direction to parents, regarding the future being's physical endowment.

According to Finkelstein and Moyer, whose work has done so much in rationalizing infant feeding, the classification of pathologic conditions is based on the reaction of the child to its food. The first meal may give the infant a dyspepsia, which may quickly change to the state of decomposition—sometimes called malnutrition—or intoxication, called dysentery—from the effects of which it may never fully recover throughout life. It has been found that foods rich in fat very frequently produce a constipation in which calcium is withdrawn from the system.

Since enamel contains from 95% to 97% and according to some authorities 100%, and dentin about 75% of these inorganic salts, any factor that will deprive the system of its required elements, or alter its normal balance, so that the building of these tissues is impaired, should rightly receive our close attention in order that we may have strong enamel and good dentin to deal with in later years. Our attention should be given to infant feeding whenever it is possible, not alone to insure the best possible tooth structure, but also to give the child an efficient resistance to disease.

The value of a high physical resistance to disease is shown in children who have suffered severe attacks of exanthematous

*Read before the Chicago Dental Society.

fevers during enamel formation—whose teeth later show none of the usual enamel atrophy.

Variations in enamel have been produced experimentally in animals by variations in diet. It may also be that malnutrition is responsible for the absence of some of the permanent tooth germs.

One young man recently presented for treatment in whose case eight permanent teeth were missing as shown by the radiograph. His early diet was entirely made up of malted milk.

A pair of twins are now under observation, being 8 years of age, giving history of great difficulty with the infant diet. Their teeth are nearly devoid of enamel while several permanent germs are absent, as is shown by the radiograph.

In these cases the missing teeth are all anterior to the first permanent molar. It is also to be noted that in these cases we have early eruption of the teeth.

Too little importance is placed by many physicians upon the effect of nutritional disturbances on the development of the teeth, and of their effect during eruption upon the health of the child, that we should always be ready to advise parents when children are suffering from the so-called diseases of dentition.

The earlier a child is brought to the dentist for supervision, the better, for it will enable the operator to obtain control, and will give him better opportunity to do for it what is best. Too often the first meeting is when the child's nervous system has been wrought up with pain, and its apprehension of further torture is founded on tales inadvisedly and carelessly told by parents or attendants.

To deceive a child with regard to dental operations, to tell it it will not be hurt and then inflict pain, is lessening its confidence in your honesty and integrity and justly merits the failure that will certainly follow. When it is learned that the child's mind has been filled with a dread of dental offices, by harrowing tales of torture, it will be quite within the bonds of reason to administer a just and severe rebuke to the offender, and it will require your utmost effort to destroy in the mind of that little patient, its sense of fear. The dentist should never allow the child to be deceived, for there is no more fatal error, since, to obtain the confidence and respect of children is recognized to

be the chief factor and great essential in their successful management.

He should cultivate great kindness and infinite patience. However, there will occasionally be those so spoiled in their home training that the parent has lost control, and the dentist will find it necessary, through a sympathetic understanding of the situation and a rare exhibition of firmness and self-control to administer the first lesson in obedience.

To make them feel that the pain is an unfortunate incident of practice rather than the rule is one of the principles to which to devote much care and attention.

Unlike the young of the lower animals who care for themselves through instinct from birth, the child mind is developing; it is constantly learning from birth on, and the experiences of its early days will often make strong, favorable impressions which are of great assistance in after practice.

We will not feel that operations on the deciduous teeth are of little consequence if we believe that dental disease is a disease largely of childhood, and we will use our utmost efforts to successfully remove every focus of infection. The object in filling deciduous teeth, aside from removing the foci of infection, is to keep them comfortable and in proper anatomical relationship for the few years they remain in the mouth, rather than to do permanent artistic work. To lose sight of this fact, or to regard the treatment of deciduous teeth of little importance is to lose sight of the possibility of fostering colonies of bacteria, to be handed on or to be bequeathed to the permanent teeth.

Many times when a child is brought to a dentist for the first time it is necessary to temporize, much time being spent in doing that which falls short of the desired operation, rather than to attempt permanent operation, and run the risk of destroying the confidence of the patient.

In very young patients, where there is superficial caries—or grooves, pits, and fissures show signs of infection, I like to bathe the teeth repeatedly in two per cent nitrate of silver, the object being to arrest decay. This treatment is also specially effective in those cases where rapid whitening of the gingival enamel takes place, even to passing the areas of immunity.

A two per cent solution of nitrate of silver will not injure

the mucous membrane of the mouth and any excess may be neutralized by following with a wash of normal salt solution.

In the preparation of cavities I like to use the hand excavator wherever possible, rather than the dental engine, for these teeth are usually very sensitive, and the sharp, well directed excavator produces less discomfort to the little patient than does the burr. Owing to the large size of the pulp there is not much tooth structure in which to attempt deep anchorage. Ideal cavity preparation for the retention of permanent filling is therefore often impossible. For this reason, plastics are indicated.

For cavities in the anterior teeth, oxyphosphate of zinc does very well, but in mouths where rapid disintegration of the cement takes place, it must be repeatedly renewed. If cavities in the anterior teeth are very shallow, they may be cut out and polished and treated with a freshly made saturated solution of nitrate of silver, according to the plan advised by Dr. Black.

The angle may be cut away with file or disc, until a flat surface is obtained without attempting to remove the decay in the dentin. This surface is polished and then treated until a full, black color is obtained in the decayed dentin. This method should only be used in shallow cavities which can easily be kept clean after treatment or on decalcified enamel, where the enamel rods have not been broken down. The rubber dam should be slipped over the tooth and should be held in place with the fingers whenever stronger than a two per cent solution is to be used. Nitrate of silver may also be used to reduce the sensitiveness in cavities in temporary molars, which may be filled later with less discomfort to the patient.

The proximal and compound proximal cavities are more difficult to manage as there is little tooth structure to work upon. When proper preparation can be made without the danger of encroaching too closely to the pulp, amalgam is the best filling material to use.

It is usually impossible to get sufficient retention to make an amalgam filling without causing needless discomfort and perhaps the loss of control of the child. In large cavities if the overhanging enamel margins are cut away the decay should simply be removed, great care being used not to disturb that portion of affected dentin just over the pulp. These cavities

may be successfully and quickly filled with oxyphosphate of copper cement. Where amalgam cannot be used and cement is undesirable, the patient may be made comfortable with a temporary filling of gutta percha. Much of the pain and discomfort these little patients suffer is due to the packing of food in the interproximate spaces. This is first noticed when the parent finds the child is bolting its food rather than properly masticating it.

Great care should be exercised in restoring these to normal condition and in protecting the interproximal tissues from injury.

When two cavities approximate each other the teeth may be made comfortable by bridging across the interproximal space with gutta percha, providing a metal plate has been placed across the interproximal space, one end resting on the gingival wall of each cavity.

A bit of gutta percha is first placed on the under side of the metal plate to make a gutta percha adaptation, then the rest of the filling is to be placed upon it.

It is unfortunate that so often children are not brought to the dentist until they suffer pain. It is difficult to do much for them under such circumstances and they must be handled very carefully, in order that you may be able to make a proper diagnosis. Every effort should be made to relieve pain; nothing else should be attempted at this sitting. Pain due to some suppressed tooth that is trying to make its way into the mouth must be eliminated. Often the gums must be lanced in order to let the tooth through the mucous membrane. If a tooth suspected of giving pain presents a cavity of decay the first thing to do is to wash the cavity with tepid water that is sterile, cleanse it as well as possible and determine the condition of the pulp. Should the pulp give quickly subsiding response to applications of cold water (60°) the cavity may be excavated, sterilized with nitrate of silver and filled at once. If a nearly exposed hyperemic pulp is suspected, a pledget of cotton saturated with oil of cloves, or phenol camphor, or hydrochlorate of camphor, will usually give relief. This will also sterilize the infected area of dentin over the pulp. As soon as the pain has ceased this dressing should be carefully secured in place by means of a temporary, quick-setting cement, to be left until a subsequent sitting.

After twenty-four or forty-eight hours, this is removed, the cavity cleansed as thoroughly as possible, and a stiff paste of eugenol and oxide of zinc, or wood creosote and oxide of zinc flowed over the pulpal wall. Over this oxyphosphate of zinc, or oxyphosphate of copper cement is placed. The success of remedial measures is evidenced by a gradual reduction of response of the pulp to slight variations in temperature and a speedy return to normal tolerance. Should the pulp, exposed by caries, be inflamed or suppurating, the same procedure would be followed at the first sitting. It would be dangerous to use either pressure anaesthesia or arsenical devitalizing material, upon such a pulp, until the inflammation or suppuration had been reduced.

Any one of the anaesthetic measures used in pulp removal in permanent teeth may be adopted at the next sitting, provided the little patient will permit. In teeth having completed roots, or unresorbed temporary teeth, there is little danger in the use of arsenic paste provided it has been much diluted and carefully sealed into the cavity.

It should not remain longer than twelve hours, after which it should be removed and a dressing of dilute, formocresol, 5 to 10% sealed in the cavity to await complete death of the pulp. If resorption has begun arsenious acid should not be chosen as the devitalizing medium. Success has often attended the devitalization of the pulp of such teeth by repeated applications of chlorid of zinc or phenol, or sulphuric acid. Pressure anaesthesia gives satisfactory results very often. As much caution should be exercised in treating these teeth, as in caring for the permanent ones, even though they are to be retained only for a few years. The rubber dam can be used more often than is generally supposed, if small squares are cut, with a hole in the center and held in place with the fingers rather than with the usual appliances.

The pulp chambers must be thoroughly and widely opened to give ready access to the canal, which should be well cleansed. Wherever small particles of pulp tissue remain in the canal, they may be removed by the use of minute quantities of sodium potassium, care being taken to wash with peroxide of hydrogen and thoroughly remove the resultant hydrate oxide and soluble soap, which if left, would invite apical pericementitis.

Apical pericementitis may be relieved by the application of an anodine to the interior of the canal such as eugenol or phenol camphor. This is sealed in and the canal filled at a subsequent sitting. The application of a stream of hot water on the gum over the root will often give relief.

The treatment of alveolar dental abscess, with or without sinus in deciduous teeth does not differ in principle from that in permanent teeth. In cases where the suppurative process is active and pus has found its way through the process into a circumscribed area, surgical opening of the gum and washing of the pocket is indicated. Thorough asepsis must be established throughout the canal. This can be accomplished after the cavity is well opened and decay and food stuff thoroughly removed, by sealing dilute formocresol on cotton into the pulp chamber for twenty-four hours, when the canals can usually be cleansed, and a second treatment made if necessary.

When there is danger due to resorption of the roots that the formalin may injure the apical tissues, thymo-eucalyptol or eugenol, may be used. The root canals, when made aseptic by treatment, should be filled with paraffin and aristol, balsam or eucapercha, some substance that will easily seal them against the ingress of infection.

When there is a sinus we may use balsam or eucapercha, forcing same through the tract—which has previously been made sterile by washing with an antiseptic wash—until it appears at the external opening. The root filling should be one which does not interfere with the absorption of the root later on.

At all times the treatment and filling of the deciduous teeth will be modified; first, by the physical and mental condition of the patient, and second, by the progress in the development of the roots or their resorption in the process of shedding.

If resorption has progressed to any great extent, temporary measures should be used to maintain the tooth in comfort for the short time it is still to do service rather than to invite failure by an attempt to devitalize the pulp or to successfully fill the canals. Should it occur that through the physical deficiency of the child or through any difficulty in proper treatment of the alveolo-dental abscess, there should fail to be a cure, that tooth should be sacrificed. It is here that the child's physical well

being demands that we guard it against the dangers of oral sepsis.

When extraction is decided upon, we must not lose sight of the fact that the arch is apt to become somewhat contracted through the lack of growth of the bony structures.

The bones develop with teeth, and growth continues while they are retained in place. The alveolar process absorbs and the bones reduce their normal growth upon the removal of the teeth. Therefore it should be only under the most urgent circumstances that teeth should be sacrificed during childhood, and if sacrificed, the spaces should be maintained by use of suitable appliances or the services of an orthodontist secured to arrange for the increase of the space to conform to that of normal development.

The normal arch should be maintained so as to insure a proper space into which the permanent tooth may move. Well contoured fillings must be made and interproximal spaces preserved in all cases. To that end it is best when the interproximal space has been lost by proximal decay to wedge the teeth apart so that proper contour and contact shall exist in the finished operation.

Great caution in this respect is especially necessary when caries occurs upon the proximal surfaces of the second temporary and first permanent molars. In such emergency, the mesial surface of the first permanent molar may be protected by a temporary filling to advantage until the second temporary molar (or pre molar) is lost and a good gold filling may be made before the second bicuspid takes its place.

In considering the diseases of the erupting, permanent teeth in which calcification is incomplete, we have a problem which is most perplexing.

We must remember that the root of the first molar, erupting at about the sixth year, is not complete until the tenth to twelfth year, and allowing from three to five years after its appearance for each tooth to be complete and including the second molar, coming in at about the twelfth year, root formation will not be completed until the fifteenth to eighteenth year. During the earlier years of tooth development in the so-called permanent teeth, if caries be found, it is unquestionably best to use tempo-

rary fillings, but it must be remembered that just as soon as permanent fillings can be borne, the temporary fillings should be replaced.

The very best service the operator can produce is indicated, to make these teeth secure against decay. In these restorations, especially in the first permanent molar, the inlay has been of infinite value, for with this method we are able to obtain better results, earlier, than by the use of any of the plastic materials.

We occasionally are called upon to destroy the pulp in one of these teeth before the root has been completed. When a patient presents, with an exposed pulp or a hyperemic pulp, in such a tooth, every effort should be made to treat that tooth, in order to keep it comfortable for a time, without destroying the pulp in the hope that the apical foramen might still be narrowed down. Every effort should be made to reduce the hyperemia by the use of sedatives. The rubber dam placed over the tooth, cavity and tooth washed with an antiseptic solution, overhanging walls of enamel broken down, and all food and caries carefully removed from the cavity. After the dentin has been sterilized by contact for several days with a dressing of eugenol or beechwood creosote and oxid of zinc paste, which had been carefully sealed in the cavity, the dam is adjusted, dressing removed, and the pulpal wall covered with varnish (amber or Zanzibar gum cut in ether) over which a paste of oxid of zinc and eugenol is gently flowed.

All excess eugenol is absorbed away and the whole covered with oxyphosphate of zinc cement, a permanent filling to replace a portion of this, later. Should the pulp be accidentally exposed while excavating, the varnish may be made to bridge the exposure and the capping made as above. Such a tooth will very often continue its development and perform its full duty as an organ of mastication. If pulp removal is found unavoidable, a radiograph should invariably be taken to determine the degree of development of the root. With this information at hand it may be determined whether or not an attempt shall be made to save the tooth. The treatment may be carried on in a similar manner as has been described for temporary teeth, using every precaution throughout, against secondary infection.

When arsenious acid is to be used to devitalize, the cavity

is prepared and sterilized as before, care being taken to remove all remnants of food. With the rubber dam in place and the cavity dried, the application should be made to the exposure, without pressure, after the hyperemia or inflammatory engorgement has first been reduced; otherwise pain may ensue. The hyperemia may first be reduced by the method previously described, or by withdrawing a drop of blood from the pulp by puncturing it.

To control pain during devitalization, devitalizing paste should contain a powerful sedative such as cocain hydrochlorid or thymol. The application is protected with a disc of paper or metal and the cavity carefully sealed with cement. It is well not to leave a devitalizing preparation in teeth with undeveloped roots too long, twenty-four to forty-eight hours will usually be sufficient. It is better to remove it and to seal a dressing of dilute formocresol (about five or ten per cent formaldehyde) into the cavity, which will toughen the pulp tissue while waiting for it to die en masse. When this has taken place the pulp chamber and canals should be widely exposed so that they may be thoroughly cleansed, dried and filled. After thorough instrumentation fails, potassium sodium may be advantageously used to destroy any dead pulp tissue that is difficult of removal, the procedure being the same as described heretofore. If the hemorrhage can be controlled and the canals thoroughly cleansed they may be filled at once.

In filling these roots the radiograph is of infinite value as it affords a record of length and trend of the root and size of the canal. Balsam, or dissolved resin, as a vehicle with which to lubricate the walls of the canal, has proven most successful in my hands. A gutta percha, or paraffin aristol cone, made to fit this canal and measured to the proper length by using the radiograph as a guide is pressed into the soft lubricant, and the mass then covered with cement, the tooth to be filled permanently later.

If we are dealing with a putrescent pulp, acute or chronic or fistulous abscess, the treatment would be practically the same. The tooth is isolated and sterilized and the cavity opened and cleansed and sterilized. A small quantity of cotton, with modified formocresol is placed over the canal openings and the cavity

sealed with temporary cement. After two or three days the canals may be cleansed and if need be a second treatment placed within, sealed and left to a subsequent sitting, after which, unless further treatment is indicated, the root may be filled.

When we are dealing with a fistulous abscess, the root must first be sterilized, then the tract must be cleansed by washing it from the root end with first, sterile water, and then a bland solution that will cauterize it throughout.

The root being sterile the canal and tract may now be filled with balsam, eucapercha or paraffin aristol, and the tooth filled. If there is danger to the apical tissues in these widely open canals from the use of formalin, a milder remedy such as thymoeucalyptol is indicated. When there is much pain due to acute apical pericementitis, beside the local canal treatment, systemic derivation and a hot pediluvium are beneficial. Often much relief is obtained by local applications on the face over the affected area of a menthol preparation known as Baum Analgesique.

It is our duty to obtain the opportunity to watch the teeth of children in order that they may be preserved for them in comfort and usefulness throughout life.

The dentist must begin early to educate the parent to the necessity for oral prophylaxis in the care of children's teeth. No effort will repay him so bountifully as the satisfaction at seeing the children grow up with good, clean, healthy mouths.

PROCEEDINGS OF SOCIETIES.

WISCONSIN STATE DENTAL SOCIETY, FORTY-THIRD ANNUAL MEETING, MADISON, JULY 22-24, 1913.

DISCUSSION OF DR. GREENFIELD'S PAPER, ON "IMPLANTATION OF
ARTIFICIAL ROOTS FOR CROWN AND BRIDGE WORK."

DR. W. H. G. LOGAN:

Mr. President, and Members of the Wisconsin State Society: The man to discuss this subject appropriately should be a man that has done the work; that has had his failures, and had his successes, and then tell you what he thinks about it; for if he has not done these things he must go by precedent. He must

follow the rules as taught, in reference to foreign materials in bone under pressure. If you go to the rules of bone in its reaction on metal under pressure, you would say to begin with that it is wrong; that it will not work. A man has come a long way, and he tells you that it does work. What do you say about it? All you can do is go head and watch his results, or try your own and watch those, and then determine whether precedent is right or wrong. Put metal in bone, put pressure on metal. Metal thrown off. Put metal in bone and allow it to be bathed with secretions that are not sterile, infection follows. That is what precedent tells us. So what can we say? We can only say this man has gone against precedent, and he tells us he has found out that precedent is wrong, and a great citizen of this state, a great citizen of the world, the great surgeon of the world, Murphy, recently defined what genius was, and he said "What is the barrier to genius? Lack of knowledge? No. Early opportunities? No. What? Precedent." So don't pay too much attention to precedent so long as you are not interfering with function, not interfering with the wellbeing of humans. After that, go ahead. So all I can say on this occasion is that I wish to pay my compliments to the effort the man has made, and to the results that he has brought before you. If he is right, dentistry is to be revolutionized. If he is wrong, you will find it out, and then is time enough to condemn him.

DR. T. W. BROPHY:

Metal has long been known to remain in the tissues an indefinite length of time without exciting irritation. Many an old soldier carries a bullet or bullets which were shot into his body over fifty years ago, and in some instances they have caused no inconvenience. Metal splints are now placed on fractured bones and allowed to remain permanently. Network-like pieces of metal are used for the purpose of treating inguinal hernia, placed in the tissues and there remain without discomfort, and as the tissues permeate these openings and unite, these network plates serve an important function. Silver plates have been used in the treatment of openings in the crania from time almost immemorial and are well borne by the parts. I might go on and cite other instances of metals placed in the tissues, but those I have given are, I think, quite sufficient.

The plan of inserting basket shaped tooth roots into sockets prepared for their reception, is unique and must necessarily claim the attention of scientific men. I have seen patients who have been operated upon by Doctor Greenfield—those in whose maxillary bones basket shaped roots have been inserted, and later these roots have been used as the abutment for bridges, which were quite firm and seemed to be doing very well.

There is just one phase of this subject that must not be overlooked and that is, How long will such roots be retained and perform the work that has been assigned to them? There are two factors further that must not be forgotten: Operating and adjusting these roots with antiseptic cleanliness, and excluding all secretions from the socket after the root is inserted until the granulations may fill up the basket and hold the metal basket firmly in place. The second consideration is this: The conditions met with after these roots have been adjusted are quite different from those in which metal has been used for the treatment of inguinal hernia, or plates upon the skull, or steel splints fixed upon broken bones. In all instances save that of the implanted tooth roots, the parts may be kept still without friction, so that Nature has a chance to accomplish the healing process. With a tooth root supporting a crown or bridge, the act of masticating must necessarily produce some irritation about the root and keep up motion a greater part of the time.

I have not had experience in the management of such cases, but I present this thought to those who have, feeling that failure may come from loosening of the root and infection about it such as we meet about the normal root, and exfoliated. If the profession can be convinced that such roots will remain and be useful over a period of number of years, this field of surgery will become a very important one.

DR. E. J. EISEN:

The paper which has just been presented to you deserves a better effort in reply than I am capable of making. The man presenting it and the method are both new and welcome additions to a program, marking, in my opinion, a new and exalted epoch in our society's history. The presentation of a new and valuable method to a profession in a broad and unselfish manner, as Dr. Greenfield has done, ought to make us his debtor,

not alone for the good he has done us, but also for the good of those seeking relief from conditions heretofore impractical of correction.

Being without actual knowledge as to the methods final application and modification, I will limit my discussion to the pathological questions involved.

Dentistry appears to me in a much different light today than it did fifteen years ago. At that time I was ready to accept certain laws, which as they were presented, seemed to limit our practice of certain methods to a circumscribed and definite principle. I have since found out by experience that the recuperative powers of the body and its individual organs and tissues is in many cases so wonderful that hesitancy to apply a radical method is becoming less and less formidable. It is truly wonderful, when we consider it, what the tissues of the mouth will tolerate. As a method I accept it without hesitation as to its authors experience. As regards its indication, I will allow myself the liberty of calling a few precautions to your attention. It is primarily indicated, it seems to me, in only those cases which give an absolutely clear history of normal conditions—that is, systemic conditions.

With a history of tuberculosis, arthritis, diabetes, syphilis, malnutrition and other degenerative processes I should imagine it would be contra-indicated. Necessarily it is not the method of choice in most cases. Hence its application should receive careful consideration as to its prognostic elements. The possibility of infection should be minimized by a careful, in fact hypercritical asepsis. Naturally the most important question as to its applicability would be the determination as to the amount of healthy, bony tissue present to hold the implanted fixture.

Radiography is here the only sure method of determining this. To do such an operation without first applying this test would seem unscientific and presumptuous. A thorough knowledge of anatomy, especially as it relates to the antrum, is a necessary requisite. The alveolus is an uncertain quantity, and its structure ought to first be determined in this way. I imagine that granulation tissue ought to be avoided as much as possible.

DISCUSSION OF DR. IVY'S PAPER ON "THE MOUTH IN THE ETIOLOGY AND SYMPTOMATOLOGY OF GENERAL SYSTEMIC DISTURBANCES."

LOUIS F. JERMAIN:

The importance of oral sepsis in its relation to septic processes elsewhere in the body; I dare say has not in the past been fully appreciated, at least not by the medical profession. Careful examination of the oral cavity, for pathologic conditions having their origin in this region; as well as for evidences of disease elsewhere, should be made as much a routine procedure, as the examination of the chest, abdomen or nervous system. I am certain that if this were done, in every case, many obscure conditions would be recognized and proper alleviation afforded.

I heartily agree, with the writer, in that provision should be made in the curriculum of all medical schools for the instruction of the student in the pathology of oral affections, and the important etiologic relationship between these and many as yet more or less obscure gastro-intestinal and circulatory disorders.

Since Wm. Hunter, in such a masterly manner directed attention to the mouth, as an avenue of invasion, of the system by bacteria, much original research work along this line has been done. It is well known, that the gastrointestinal tract harbors a profuse bacterial flora, and it is equally well known, that it is not a matter of indifference, whether this is a normal bacterial flora or not. A healthy bacterial population serves as a protective mechanism to the host, while alien organisms if unrestricted in their growth, leads to such well known diseases as typhoid, cholera, and dysentery.

Kendall has shown that at birth, for instance the feces are sterile, within eighteen to twenty-four hours bacteria make their appearance—a mixed infection—these are probably all introduced through the mouth, by the third day the *Bacillus Bifidus* predominates. With the advent of alien food the Bacterial flora again undergoes a change, and the *Bacillus Bifidus* is replaced by *Bacillus Coli*.

It is evident then that the constant invasion of the gastro-intestinal tract by alien organisms from an infected mouth not only must lead to disturbances of function, but may lead to pathologic change of the gastro-intestinal mucosa and permit of

systemic invasion. Furthermore, as has been stated bacterial products by their absorption, may seriously influence normal metabolic processes, and through hemolysis or interference with normal blood formation result in such disorders as chlorosis, pernicious anemia and the leucemias. The relation of septic processes in the mouth and gastro-intestinal tract, to pernicious anemia, is fairly well established at least clinically, not so with the leucemias, and yet I have within the last year seen two cases of acute lymphatic leucemia follow immediately, upon a severe infection of the throat.

That septic processes in the mouth, throat and sinuses lead directly to septic processes in the joints, has been conclusively proven both clinically and experimentally. The streptococcus rheumaticus, streptococcus mucosus, streptococcus haemolyticus, streptococcus (viridens), all found in the mouth under abnormal conditions are also found in the joints in arthritis. The first three, commonly, the last one rarely. Davis reports forty-two cases of arthritis in which the tonsils were removed, in thirty-eight of which streptococci were obtained in pure culture from the deeper tissues of the tonsils. The organism most commonly found was a haemolytic streptococcus, which if injected intra-venously into rabbits almost invariably, produced multiple arthritis. Primary tuberculosis of the tonsil is found in from three to five per cent of tonsils examined. The consensus of opinion seems to be that pulmonary tuberculosis rarely results from infected tonsils, but that in tubercular cervical adenitis in children, the mouth and throat are frequently the portals of entry. Careful research has shown that there is no direct connection between the cervical and pulmonary lymphatics.

Another important structure frequently invaded through sepsis of the oral cavity, is the endo-cardium. I am certain, that I have seen many cases of endocarditis follow septic processes in the mouth and throat, without any clinical evidence of previous affection of the joints.

Much is being written and said by the medical profession, as to the relation, existing between disease of the tonsils and sinuses, and disease elsewhere, but I am convinced that not enough attention is directed to the structures anterior to the

tonsils and the removal of tonsils without the eradication of septic foci in the teeth, gums, etc., from which the septic material emanates, is useless.

I feel like Dr. Ivy, that it is to the interests of our patients and conducive to the advancement of scientific knowledge, that a closer co-operation between physician and dentist be established.

LEON S. MEDALIA, M. D.:

Mr. President and Members of the Wisconsin State Dental Society:

I am very sorry to be unable to be with you and discuss the very able paper of Dr. Ivy in person. I am glad to do the next best thing and send you this written discussion.

"The Mouth in Etiology and Symptology of General Systemic Disturbances" is certainly a very important subject and cannot be discussed too much. Dr. Ivy has chosen well both as to the subject and title of his paper.

I agree with him perfectly that the dental schools and, for that matter, also the medical schools, ought to pay more attention to diseases of the mouth and their relation to systemic disturbances than they do at present. I do not think, however, that this can be done by cutting down other subjects because as it is, medical students and especially the dental students in their three year course, are none too well prepared for their life work. They certainly need their physiology, also their anatomy. I should rather see the daily curriculum made larger or another year added to the course without curtailing the present subjects. However, such details can easily be left in the hands of those who prepare the curriculum.

I am sorry that I must admit with Dr. Ivy that medical textbooks on surgery and medicine have very little to say on the subject under discussion. This is, I believe, the underlying reason for the mistakes in diagnoses made by medical men whenever the underlying cause for a given disease is an infection of the gums or oral cavity. I have called attention in an exhaustive paper delivered before the National Dental Society last summer, to the relation of, what Dr. Ivy calls the commonest of the infections of the mouth, namely chronic alveolar osteomyelitis—pyorrhea, to the systemic disturbances accom-

panying it. In this paper which was published in the January and February number of the *Cosmos* this year, I reported 115 cases which I had under observation and which I studied in detail. The findings, as recorded, there of the common general diseases accompanying this apparently local disease—chronic alveolar osteomyelitis—were:

Chr. Alveolar Osteom yelitis or pyorrhea	Rheu- matism	Gastro- Intestinal	Skin affections	Chronic Catarrh
Incipient Stage.....	35%	50%	14%	7%
Moderately advanced	38	50	12	6
Far advanced	53	50	13	5

Dr. Ivy's discussion on the effects of pyorrhea on the gastro-intestinal tract; on the vascular system; on the joints; on the nervous system; on the respiratory tract, is certainly very good but I, for one, would rather see actual cases cited from the literature or personal cases, that would bear out the statements of the relation of the local disease, chronic alveolar osteomyelitis or pyorrhea, to the various systemic disturbances for which it is said to be responsible.

The relation of decay of the teeth and infection of tonsils to tubercular infection of the cervical glands and even to the lung tuberculosis has been established by various writers and is well called attention to here by Dr. Ivy. Personally, I do not treat a case with cervical adenitis without first paying attention to the tonsils or teeth, and the results in my cases have well justified the procedure. I also have had cases of trifacial neuralgia, a few of which have been mentioned in the already referred to article, which apparently were due to infection of the gums and yielded to the vaccine treatment. The nervous disturbance may of course also be due to the various causes mentioned by Dr. Ivy, such as pulp stone, impacted tooth, etc. This point has been well emphasized by Dr. Cryer in a paper read by him at a recent meeting of the New Hampshire State Dental Society.

I certainly agree with Dr. Ivy to the importance of syphilis in general and its recognition by the dentist in particular. I believe that almost all text-books on dental pathology and therapeutics, and on dental surgery recognize the importance of this disease and give detailed descriptions of the signs and symptoms and how it should be recognized and dealt with by the dentist

from his standpoint. It will, however, always remain a disease to be diagnosed and treated by the medical man. It cannot, however, be discussed too often or emphasized too much and Dr. Ivy paid a good deal of attention to it in this paper.

The other diseases mentioned, such as mercurial stomatitis, and lead poisoning, I believe with him could both be helped or done away with if the teeth and gums were kept in proper condition.

As to hemophilia which is of a hereditary nature, I have had two cases, and in one case in particular—a little boy of 9 who had bleeding and joint affections—the bleeding would almost always come from around a decayed tooth or infection of the gums. Lime in the form of calcium chloride, $\frac{1}{2}$ teaspoonful doses well diluted twice daily after meals, and the autogenous vaccine obtained from the infectious bacteria as well as attention to diet, made a great deal of difference in relieving the boy of the swelling of his joints. I checked his bleeding.

In a paper delivered at the last annual meeting of the New Hampshire State Dental Society I have discussed 15 cases of acute infections of the oral cavity, such as the various dento-alveolar abscesses, mandibular and otherwise. In this paper, which is soon to be published, although more attention is paid to the bacteriology and vaccine treatment of these acute affections the detailed discussion of the cases, however, also bring out the general systemic conditions of the patient accompanying the local infections.

This is a very important subject. The relation of the mouth infections and disturbances of the oral cavity to general systemic diseases, I must repeat, is of great importance to the dentist as well as to the medical man and I am happy to see it discussed and attention paid to it more and more in these days.

I want to emphasize what I have already said at the National Dental Society: that the citing of actual cases thoroughly studied and results obtained and conclusions drawn from them will go much farther in establishing the relation of oral sepsis to general systemic diseases than any number of general discussions on the subject. I am sorry to say that most of the articles met with in dental literature are of the latter type and I shall certainly feel very much gratified if my calling atten-

tion to this fact again and again would stimulate closer observation and the keeping of fuller records of cases by the dentists, to be used in their publications and which would help to establish definitely the relation of the diseases of the mouth to the general systemic diseases.

CHICAGO DENTAL SOCIETY.

A regular meeting was held March 18, 1913, with the President Dr. James H. Prothero, in the chair.

Dr. John F. Stephan of Cleveland, Ohio, read a paper entitled "The Treatment and Filling of Children's Teeth."

Dr. Frederick B. Noyes, followed with an illustrated paper entitled "The Function of Each Tooth in The Development of the Face."

DISCUSSION.

These two papers were discussed together.

DR. J. P. BUCKLEY:

It seems almost too bad to disturb the peace of mind that must exist here after we have listened to these two most excellent papers. I assure you I will not detain you long, so what little I will say will be in connection with the first paper for the reason that I know very little about the second. I know enough about the second paper, however, to admire it, and Dr. Roach told me one thing about the slide where the boy, in order to prevent masticating on the exposed pulps, learned to slide his jaw forward. Dr. Roach said it was not a slide, it was a skid, and to prevent that you ought to use chains. (Laughter.)

I have admired for a long time the modesty of Dr. Stephan. Those of us who know him well know that he is always ready to apologize, but when we listened to his paper we learned if we did not know before, that no apology from him is necessary.

I want to emphasize, and that is all I can do intelligently, what he has said. There is only one point in the paper that I can honestly and conscientiously differ from him, so I will only emphasize the various points he has made. We have learned tonight, if we did not know it before, the importance

of saving the deciduous teeth. But how and when to do it is a serious problem. The best way to do it, of course, would be to teach the mothers or the guardians the importance of the teeth, so that they can prevent these discouraging conditions that come to the general practitioner, so that we can keep the teeth intact, free from decay until they would be shed by nature. But this is an ideal condition, and not one that we have to meet in our daily practice.

One of the most important considerations in connection with the treatment of children's teeth is to gain the confidence of the little child. Now, you cannot tell any man how to run his business, how to make or save money, neither can you tell any dentist how to gain the confidence of the child. If the dentist has not the natural or native ability, I might say, by which he can handle that little child, it is useless for anyone to try and teach the dentist or to show him how he can gain the confidence of that little patient. It is absolutely necessary, however, to gain this confidence.

Dr. Stephan said he used the hand instrument in every place he could in preference to the engine. He did not tell us why he did that, but because a little patient likes it better. These little patients like the hand instrument better, because with that instrument he does not get bone conduction. You probably have been at the table when you were eating celery and wondered if anybody around the table heard you making a noise. The sound travels from the teeth to the ear through the bone. The bone conducts sound, and if you are drilling into a tooth, that sound is magnified to the patient far more than you realize or appreciate unless you yourselves have been patients. So it is well to avoid the use of the engine, thereby preventing the sound from being carried and magnified in the ear and mind of the little child. It is well to use a hand instrument as much as we can.

So far as therapeutic agents are concerned, Dr. Stephan uses silver nitrate after the method of Dr. Black. Dr. Black advocates staining these cavities with silver nitrate and then, if possible, exposing the cavity to sunlight. It is necessary to have the silver nitrate acted upon by a light of some kind, preferably sunlight, in order to get the therapeutic value of our

agent. I have found in my office having an east window and very little sun, I can get the same effect by using the electric mouth lamp, cauterizing the carious dentin with a stronger solution than Dr. Stephan uses unless he uses the rubber dam. I use a saturated solution, and then exposing the cauterized area of dentin to a little electric mouth lamp, having always on hand an antidote which he mentioned, normal salt solution, or some solution of sodium chlorid.

In the treatment of abscesses in deciduous teeth it is never necessary to establish a sinus. If you have an abscess in a deciduous tooth, with pus oozing out of the gums freely upon the slightest pressure, if you seal in that tooth formocresol the pus will virtually dry up. It will disappear. I never intentionally establish a sinus in a deciduous molar tooth. After the canals are sterilized I never attempt to fill the root with any gutta-percha points. I simply fill the root with a solution of gutta-percha. The solution I use is known as eucapercha compound and as I force this solution into the pulp chamber and root canals with gutta-percha, I let the eucapercha, if it wants to, flow right out from the canals through the sinus. Before that time I never made any special attempt to establish a sinus in a tooth I wanted to save for three or four years.

Dr. Noyes has shown us the importance of saving the deciduous molar until the permanent tooth has erupted to take its place. When I want to save a deciduous tooth for two or three years I fill the cavity with gutta percha at the same time I fill the roots, having the gutta percha quite warm, and having it also softened with the eucapercha so as to go right down in the pulp chamber and extend into the canal, dressing the entire gutta-percha off and leaving that in as a permanent filling. I have been surprised how hard the gutta-percha gets and how well it will save a deciduous tooth until such time as it is ready for extraction.

Some men have claimed that in a deciduous tooth, when the pulp is removed the resorption of the roots is interfered with. I do not know whether the roots are resorbed as readily or not when the pulp is not in the tooth, but that resorption takes place in the roots of a deciduous tooth the pulp of which has been removed I know to be a fact. It is a little slower.

DR. NOYES:

If it is slower there is more or less inflammation.

DR. BUCKLEY:

Not because the pulp had been removed. Some authorities claim the roots will not be absorbed when the pulp is removed.

Some years ago I was in Pittsburgh and a prominent dentist said there was one statement in my book which he wished I had left out. I asked him what it was and he replied "the statement where you advised the use of arsenic in children's teeth." I told him that if he could tell me anything with which I could devitalize the pulp in a deciduous tooth, other than with arsenic, I would leave it out when I revised my book. He was not able to tell me of an agent that would take its place.

I was glad to hear Dr. Stephan say that he used arsenic trioxid with care and judgment as a devitalizing agent for pulps in deciduous teeth. If you used it as you should use it, knowing what the agent will do, you do not need to have any hesitation in using arsenic trioxid for the purpose of devitalizing the pulp of a deciduous tooth.

DR. DITTMAR:

At any age?

DR. BUCKLEY:

I said with care and judgment. The pulps in deciduous teeth are very susceptible to the action of arsenic trioxid and succumb readily; therefore, 12 or 15 hours is as long as it needs remain sealed in the cavity.

How to treat the pulp in a first permanent molar, so many of them being diseased before the patient presents for treatment, is a subject sufficiently broad and important to occupy an evening by itself. I am not going to delve into that subject tonight any more than to throw out a word or two that I wish dentists would study in the future, and they will be forced to do so more than they have in the past, the pathology of the dental pulp. It is necessary for the dentist to know when and how he can keep a pulp alive. Pulps are being removed from teeth far too miscellaneously and ruthlessly today. I am not of the belief that the teaching to remove the pulps of teeth for the purpose of adjusting crowns is an erroneous teaching. I

know, however, that dentists are removing pulps of teeth on the slightest provocation. We have learned tonight it is absolutely essential, if it is possible for us to do so, to save the pulp, to retain its vitality in the first permanent molar until calcification of the root is complete. If you will study hyperemia of all kinds, active and passive, and get on down into inflammation or pulpitis, you will find many of these pulps that we have believed heretofore from our experience and observation were hopelessly diseased, with the proper treatment and protection can be saved. If we study the destructive diseases of the dental pulp and learn how the tubules of the dentin are calcified under certain conditions, how that calcification can be encouraged or promoted by the proper treatment of the pulp; if we learn how we can slowly but continuously and not too rapidly stimulate the pulp, the odontoblastic layers of the pulp by our treatment and by our protecting material, and thereby cause the odontoblastic layer to throw out secondary dentin forming nature's protection to the pulp; if we will study these conditions, we will be able to save many of the pulps in the first permanent molars which heretofore have been considered by us as hopeless.

A thing that dentists need to study more are the general diseases which are produced by local foci of infection and pathology of the dental pulp, and if this is done more pulps can be saved today or allowed to remain intact than formerly, thus eliminating or preventing the local foci of infection.

I recognize the worth and importance of the papers we have had in the past few months. I recognize their value, but when I think of the miscellaneous manner in which dentists are removing pulps, careless so far as asepsis is concerned, and the large number of chronic abscesses as a result following the indiscriminate removal of pulps, it is astonishing that more conservative methods are not practiced. All root canals are not filled like the canal of the tooth which Dr. Stephan showed us was filled with gutta-percha, having been in his jaw thirty-one years, and while the root is not complete, the bone is healthy. There is no sign of infection. That root was filled with gutta percha. The operator did not depend upon the so-called permanent anti-septic power of the root canal filling, such as are advertised

and highly recommended today. There is no such a thing as a permanent antiseptic root canal filling. It is only a catch phrase used by the manufacturers of root canal filling material to sell the material. (Applause.) If dentists would learn to fill roots not with this zinc oxid formaldehyde paste, but with some kind of gutta-percha or some other kind of material that nature would tolerate and keep the bone and tissues in the apical region healthy, we would be doing a great deal.

I have talked longer than I intended to. I realize, as I said in the beginning it is almost a shame to introduce any kind of a discussion after we have listened to these scholarly papers.

I want to thank Dr. Stephan for his kindness in coming here and reading this paper, and I always wondered where Dr. Noyes got the material to produce his beautiful and original slides.

DR. J. A. BURRILL:

Dr. Noyes made an excuse for his paper, but as you have all seen he did not need to do so. I have been asked to discuss Dr. Noyes' part of this program, but before doing so I wish to call attention to one point in the paper of Dr. Stephan, a point he did not mention, and one which to the orthodontist is one of the most important things in the care of the deciduous teeth. I may not be able to quote him correctly, but if I understood him rightly he said that the object of caring for these is to prevent the local foci of infection and to make the teeth comfortable. Both of these are important, but to the orthodontist there is one thing just as important as those two things, and that is to keep that tooth in its normal position and of normal size. He has not provided for the closing up or contraction of the arch from a lack of contour and things of that kind. In this connection I am reminded of the paper which Dr. Roach read before the society last month. He, instead of separating the teeth to put on a crown, cut out the side concave shape to make room for the interproximal gum. According to the orthodontist, they should have been separated and the full size of the tooth restored, and then he would have space for the interproximal gum tissue.

The paper of Dr. Noyes was admirable. He has shown us clearly the mechanics of development of the jaw; how these

temporary teeth have guided the permanent teeth on into position, and how like teeth in their proper position will guide the permanent teeth into abnormal positions.

There are a good many things I call to mind, and if we can have some of the slides thrown on the screen I will point them out. I am going to call your attention to something that Dr. Noyes did not mention in his remarks. If I recall one of the slides, you notice a secondary temporary molar still in place. What is the reason for that tooth being in place? Is there any reason for suspicion? When you find a second temporary molar in its place in the jaw, or when the second molar is badly erupted, is there any reason to suspect that there is something wrong that has caused the temporary tooth to be retained? You will notice that the divergence of the roots of the temporary molar is very great. The apices of the roots are spread out, so that the next permanent tooth in its eruption has not caused the proper absorption. I want to show one of these teeth that has been extracted. Here is a lower second molar, and I am sorry I have not got a skiagraph of that tooth in the mouth. In that particular case the bicuspid was right up in the bifurcation and held in position because absorption had not taken place in the roots. The divergence of the roots was so great that the permanent second bicuspid had not caused absorption in this particular case, and you have all seen these cases—the first permanent molar and first bicuspid have developed higher in the jaw than that wedging the tooth in between the crowns of the permanent teeth, so that it could not come out if it wanted to.

This is a slide showing the tooth of the same patient on the opposite side of the jaw. These teeth were retained until the permanent molars were in place.

This is a slide of an upper second temporary molar, but not in the same patient. The picture does not show clearly just how absorption has taken place. You can see it on the lingual root. Absorption has touched very little the other two roots. Eruption of the permanent teeth has taken place up to the point I show you, so that it was in contact with the pulp. The other is the mate to the other side of the mouth showing the same condition. I cannot see any other reason for the non-absorption of the teeth than the fact that the divergence of the roots was

great. If this tooth is held to that (indicating), you can depend upon it that there is something wrong and we have the X-ray to help us out, and we can determine the position of the permanent teeth. You will find, when a tooth is as solid as this, it will take considerable time for the permanent bicuspid to get up to its place. It has been held two years beyond the normal length of time in the jaw. All of this time the development of the root has been going on in a downward direction rather than forcing it outward. In extracting a tooth in this condition, it is necessary to hold the space so that the tendency on the part of nature to close the space between the first permanent molar and the bicuspid will not narrow it till the tooth cannot get out. It will erupt more slowly than it would at the proper time.

In this slide you will notice two bicuspids are unerupted. On the other side they are in perfect eruption. The reason why they are being held back into this place is because the temporary teeth are gone, but they are still being held down there. The roots of the bicuspid have developed to this stage, and the reason for this is the temporary teeth were taken out too soon, and with the closing of the grooves, which the temporary roots occupied in the reforming of the bone we have got a hard plate of bone, and it is difficult for them to cause absorption. It is not bone, although it is hard. It is fibrous connective tissue, which is almost as hard as bone, and it is difficult for that tooth to force its way through. The teeth are coming through and will get through in time. The skiagraph does not show it. The length of the tooth you see in this slide represents the amount of the development there should be at the time the teeth are in that stage of eruption, but they have got beyond that. The root development has gone far below what you see on the skiagraph.

It has been a matter of great interest to me to hear Dr. Noyes explain the mechanics of development of these permanent teeth in the jaw and the fact that the roots of the temporary teeth guide the permanent teeth in their eruption, which brings us to the conclusion that the temporary teeth are going to guide the permanent teeth into place, or if the temporary tooth is in malposition the proper time to take care of the case will be to put the temporary tooth in place and give nature a chance to erupt the permanent tooth in its position.

DR. J. P. BUCKLEY:

Dr. Dittmar tells me he is afraid the statement I made with reference to the use of arsenic in children's teeth may be taken too loosely and I want to explain how long I leave the paste in the tooth. I would not leave it in 24 hours if I could avoid it. I would seal it in tonight and take it out the next morning, because these pulps respond readily to cocain and arsenic.

DR. T. L. GRISAMORE:

I would like to take this opportunity to thank Dr. Stéphan for coming here and presenting so admirable a paper, one which I think will be of great benefit to us. I also wish to express my appreciation of Dr. Noyes' instructive talk.

If there is any one thing in my judgment the general practitioner of dentistry today is neglecting it is the care of children's teeth. They are neglecting their duty from two points of view, and in so doing, are making a mistake. One is from their own point of view, and the other is from the standpoint of the child. In the first place, dentists make a mistake when they do not take care of children's teeth. They tell us that the parents will not pay for the service. I firmly believe the reason that children are neglected, much as I dislike to believe it, is because dentists do not like to work for children and because they imagine they cannot collect a reasonable fee. There is no reason why parents should not pay for work on children's teeth. They pay the eye, ear, nose and throat man for treating any pathologic condition connected with these organs, and if they do not pay it is the fault of the dentists themselves. If people are not paying the dentists for caring for children's teeth it is because they have not been educated to do so and do not realize the benefit the child will derive therefrom.

There is no way you can reach the heart of a kind father and loving mother more readily than by being kind to their children and many are the parents who have drifted from the care of their dentist, who has treated them for many years, to the younger man because he had the time and patience to properly care for their children. Many of these parents are far more anxious about the quality of dental service their children receive than they are about the services in their own mouths. If we are not rendering to these little patients our best services

we are neither fair to them or their parents. I know as well as anyone in this room you cannot do everything for children, but I know you can do many things for them, and the question is how much tooth tissue should you save? You should save all the deciduous teeth you can. Do not expect to save them all, but save them all if you can. If you cannot save them all, there are eight teeth in the mouth you should save. These eight are the second deciduous molars and the cuspid teeth. If you will save these eight teeth you have done a great deal towards developing the arches and preventing future trouble for the child. If you lose the second deciduous molar, the first permanent molar becomes displaced, and as a result of that you either have an impacted second bicuspid or a protrusion of the denture or maleruption of the cuspid teeth. You should save the cuspid. If you do not, the four anterior teeth will be forced back by the muscles of the lip. The posterior teeth will come forward, and there will not be space for the cuspid when it comes. The jaws are full of teeth and as soon as you take out a tooth you lose contact, the space gradually closes up, or if it does not close up, it does not develop. Save those four teeth above all others.

Regarding the first permanent molar, I remember when I entered the dental profession of attending a meeting where they were discussing whether we should extract the first permanent molar, and if we had to extract one, should we extract two or all four? It reminds me very much of a discussion before a surgical society of whether in cutting off one foot they should cut off the other, and if they cut off both feet whether they should cut off both hands as well. Such a discussion is on the same order as the extraction of the first permanent molar.

DR. EDMUND NOYES:

It is a matter of pleasant memory that the first paper I ever read before a dental society, about half a year after I came to town, in the spring of 1868, was on the preservation of the first permanent molar, and it was at a time when *one* of the two most prominent practitioners in Chicago was extracting all four of the first permanent molars for a large proportion of his young patients. We have all seen a great number of his cases that were treated in that way.

There is one thing that Dr. Fred Noyes spoke of that, it seems to me, we want to keep in our minds a little more clearly and prominently than most men are apt to, namely, that the loss of these teeth means deformity and lack of development of the whole face, and a lack of symmetry of the upper part of the face as compared with the lower. The beauty of the personal expression of the face is forever marred in all cases where the services of the orthodontist are needed and not rendered.

One other thing about the care of children's teeth. There are two distinct contra-indications for the use of arsenic. Dr. Stephan alluded to them, but I think I am justified in repeating them and stating them clearly. There are cases where the roots of temporary teeth have become partly absorbed and, on the other hand, there are cases where the roots of permanent teeth have not been completed. These two conditions contraindicate the use of arsenic for the destruction of the pulp. Fortunately all pulps under these conditions, either way are more amenable to treatment and less likely to die under treatment than any other pulps we have to deal with, and many a pulp in a tooth of that character can be saved, although you would not attempt to preserve it if it were in a tooth with a completed and fully developed root.

DR. G. W. DITTMAR:

It is getting late and I do not want to detain the society long.

First of all, I wish to thank Dr. Stephan for his excellent paper and also Dr. Noyes for his admirable contribution. However I have a slight criticism to offer with reference to a statement made by Dr. Stephan. I may be wrong, but if I am, Dr. Stephan has a right to correct me. As I understood it, he made the statement in alluding to a case where there were a number of the permanent teeth missing, "that he believed their loss was caused by a lack of nutrition, due possibly to the child not having been properly nourished, or was fed on malted milk." If I am right in quoting him, then my criticism is this: the enamel caps for the permanent teeth are in position in the jaw partially calcified before the child is born, and consequently the food that the child gets after it is born has

nothing to do with the beginning of the formation of the enamel caps; those are early formations and feeding would have nothing to do as to whether they are in position or not. We find the 20 deciduous teeth and 24 of the permanent teeth are all under way of calcification at the time of birth. The temporary teeth are pretty well calcified. Some times a child is born with erupted incisors; the 24 permanent teeth are in process of calcification, and the nourishment a child gets after birth would naturally have nothing to do with the point as to whether the teeth are missing or not.

With reference to arsenic. I think it is a pretty safe rule to figure somewhat along this line; that the resorption of the root of a temporary tooth takes about three years. In other words, if the deciduous centrals are lost at seven, the resorption of the root starts at about four, and if you have to devitalize, it will not be well to use arsenic in that tooth in a child five or six years old, because at that time there is considerable resorption. If you have to devitalize a central incisor before the child is four years of age you are fairly safe in using arsenic. Take a second temporary molar usually lost, between 10 and 11, three years previous to that root resorption begins, a child about six years of age, you are safe in using arsenic, but in a child of eight and a half or nine years of age I would not like to use it.

One other point is with reference to saving the first permanent molars. What I state is nothing new at all; it has been used for many years but it is a good thing. So often children come to us when these molars have not yet fully erupted, and we notice the enamel lobes have not properly united; there are fissures and pits, and if they are not taken care of there will be decay. The thing to do is to get them clean and dry, and work into the pits and fissures a little oxyphosphate of zinc, or better oxyphosphate of copper, and hold it down with the finger thinly coated with vaseline. By keeping the fissures closed, it will have a very material effect in keeping these teeth from decaying.

DR. STEPHAN (closing the discussion):

I am very grateful to the members of the Chicago Dental Society for the kindly way in which they have received my paper. I ought to offer an apology again to the discussers because they did not see my paper until this afternoon, which was my fault and not theirs.

There are some things which I wish to clear up because I want to be thoroughly and clearly understood. The last speaker (Dr. Dittmar) spoke of the use of cement in fissures in the permanent molars, preferably oxyphosphate of copper being a most excellent material. I spoke of the use of nitrates of silver in 2% solution in those cases in children of tender age, that is 3 or 4 years or 2 years of age, where the enamel may be affected, and we know we are going to get a defective tooth. In such cases I take 2% of nitrate of silver and flush the tooth; I flood it every two days until I get a black stain. I am not able to get it at once. In those cases where we do not know the enamel has passed the area of immunity, I have been able to check them in that way, using normal salt solution to destroy any excess of the nitrate of silver. I think there was some one in St. Louis who first used that method, and for a simple case, where we want to use preventive dentistry, it is the thing to do.

As to the resorption of the roots, where the pulps have been destroyed, I think they are resorbed exactly as they would if the pulps were not destroyed, providing there is something intervening between the roots and the cells.

With reference to the use of arsenic in devitalizing these pulps, I use arsenic paste. If I use creosote in making the paste as a vehicle, or use eugenol as the vehicle, I dilute the paste with a considerable quantity of the vehicle and dip cotton into that, getting a small quantity of the arsenious acid thereon. I have diluted the arsenical dressing that is used in these temporary teeth.

I received my instruction in this city some 20 odd years ago, and at no time since then have I destroyed the pulp of a tooth to put a crown upon it, even though it should be in the anterior upper tooth or to carry a bridge, because if we are interested in the question of oral sepsis we know that we have been inviting a condition that is greatly to be depreciated, much more so than anything we may be able to make in destroying that pulp. The medical profession are discovering now that it is these cases of oral sepsis that are carrying patients to their graves, as evidenced by the contributions of Dr. Hartzell and many others, who tell us that infection has existed for years at the apical end of the tooth unnoticed and uncared for, and

finally the patient is carried away from septicemia. I know of such cases myself. I saw the sister of a patient that came to me from a neighboring town in consultation. The dentist looked over her mouth and pronounced it in good condition. The patient was supposed to have inflammatory rheumatism. The muscles were stiffened and one knee could be raised about an inch and a half. In that case there were six teeth helpless; the canals had not been properly cared for and upon the removal of these tooth lesions, the patient's life was saved, and yet the dentist said the mouth was in good condition.

To destroy the pulps of teeth, as Dr. Buckley suggested, without good cause, is inviting a condition which we should dread to be the authors of.

With reference to the remarks made by Dr. Burrill, if he will turn to the last statement in my paper he will find that the point he mentioned is adequately covered and throughout the paper the restoration of the interproximal space is spoken of repeatedly. I tried to keep within the twenty-minute limit in presenting my paper and I did not wish to be verbose. I believe those are all the points I had in mind. I thank you for your courtesy.

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science,
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EDITORIAL.

KEEPING RECORDS OF OPERATIONS.

A great many members of the profession do not seem to realize the importance of keeping accurate records of the operations they perform. It is unbusiness like, unscientific and wrong to ignore an obligation which is so selfevident as this. A man who does not keep records has no protection against imposition on the part of the patient when a claim is made that a given operation has failed. It is quite common for patients to return with the remark that "the filling you inserted a few weeks ago is out." And it is frequently the case that the patient is innocent of any wrong intent in the matter even when the filling which failed may have been in many years and was inserted by some one else. It is difficult for people to always locate an operation precisely, and they naturally have in mind the last work that was done for them. Without records a dentist cannot convince his patient that it was not his operation which failed, even if indeed he can be sure of it himself. It is always a great satisfaction to a practitioner to be able to refer to his records when a patient returns after many years' absence, as it also is in the case of patients who have been coming periodically for a quarter of a century.

Then again the clinical value of records as it relates to the light they throw on the permanence or otherwise of certain operations is inestimable. We may by referring to records quickly learn those methods of practice which give us the best results and we may avoid the greatest sources of our failure. Viewed in this light records are exceedingly valuable.

But it is as evidence of another character in which records are even more important. It so happens that the dentist is operating upon those tissues which resist decomposition the longest of any in the physical economy. Dental operations therefore are the last to be destroyed when a body decomposes or is burned. In some of the great disasters where hundreds of human beings have lost their lives by fire or other catastrophes which destroy the identity of the individual it has been only by means of the records of dentists that identification has been established. This has occurred on several occasions, and it would be a sad commentary on the reputation for accuracy of any dentist who was appealed to for an examination of this kind and he was obliged to say that he did not keep records.

There is every argument in favor of keeping records and none against it.

THE EDITOR'S DESK.

A TRIP TO THE SOUTH SEA ISLANDS.

ANOTHER VACATION STORY.

(Continued from the December issue.)

PELORUS JACK.

One day the Mater came to us in Wellington with the story of a very wonderful fish she had been hearing about. She said it was famous all over this region as a pilot, that it met the boats coming in and accompanied them for several miles toward the harbor and then went leisurely off about its business. She said it was fifteen feet long and that no one seemed to know exactly what kind of a fish it was. We cordially accepted the latter part of her story, and agreed that no one was likely to know much about such a wonderful fish as that, and in short, we chafed her considerably for trying to ring in on us such a palpable fish story. But the strange part of it was that we learned she was absolutely correct, that such a fish actually does exist, and that it goes out to meet the ships, as she said. Its place of abode is outside of Pelorus Sound, between the North and South Islands of New Zealand, and it is famous all over that part of the world. Mr. Denniston gave me a photograph of the fish before we left Wellington, and I am reproducing it for my readers. It has been named Pelorus Jack, and has frequented these waters for at least thirty or forty years. It seems to have its

favorites among the vessels, some of them receiving very scant attention from it while others are fondled by it as if with real affection. It will sport along by the ship rubbing its sides against



Pelorus Jack, 15 ft. long, bluish white and belongs to a rare species of the dolphin family.

the hull and diving off into the deep, and then coming up alongside again as if having a wonderful frolic. One man, with more brutality than sentiment mixed up with his system, was idiotic enough to

shoot at Jack one day, and from that time on the fish never would come near that ship. Now there is a stringent law passed by order in Council protecting Pelorus Jack from injury under heavy penalty, and woe betide the luckless individual who is caught molesting him. The government of New Zealand knows how to protect its natural assets, even if it does not know how to run railroads, and I can forgive it for its roads if it will only save Jack.

The fish is silvery white in color and does not belong to any of the ordinary species, so cannot be accurately classified. It seems to be a cross between a Dolphin and a Porpoise. It blows like a porpoise, but in many other respects it is not at all identical with that species, and the only thing that can be said of it is that it is just Pelorus Jack—the one and only. Long may it thrive and be a blessing to its age and generation. (Since the foregoing was written I have received word from New Zealand that Pelorus Jack has been missing from his usual haunts for some months, and the fear is expressed that something has happened to him. It would be a thousand pities if this proves true, and I shall watch developments with much interest to see if Jack does not return some fine day to continue his entertainments. I sincerely hope he will.)

RAROTONGA—COOK ISLANDS.

The run from Wellington to Rarotonga was uneventful, that is, so far as I was concerned. My three girls found it eventful enough on account of the rough weather but if any one thinks I am going to mention humiliating details—well, I am loyal, and mum's the word. It blew some, and then it blew some more, and then for six hours we had a heavy swell which rolled the ship unceasingly. But we were fortunate enough to get cabins which were comfortable and most spacious, two en suite, one with a big double bed and lounge and the other with ordinary berths, upper and lower, and a sitting-room with lounge, table, and writing desk. The suite had a private bathroom in connection with it and was quite luxurious. Coupled with this was the fact that it was on the starboard side, a distinct advantage in coming Northeast through the tropics on account of the prevailing winds which play upon that side of the ship. Going down we had the port side, which was also greatly in our favor on that voyage.

I have said that there was nothing eventful on this trip but

one thing did happen, which I must record. On the trip over from Vancouver to Australia my readers may recall the fact that as we crossed the 180th meridian we completely lost a day out of the calendar, and that at the time I complained somewhat of having an entire day filched from me in that summary manner. Well, on the way from Wellington to Rarotonga I got that day back, but somehow it was not the same. Saturday, August 17th, lasted forty-eight hours, or in other words, we had two days which we called Saturday, August 17th. One might think that I would be satisfied with this but to show the perversity of human nature I actually rebelled against it. The thing is not arranged right. If one could have a double day and be set back twenty-four hours when he is going away from home, and then miss a day and skip ahead when he is on his way home, that would be something like the thing. But to make a man do a double twenty-four hours for one day just as he is headed for home, and when the first trace of that peculiar and unclassifiable disease known as homesickness is beginning to creep over him is an arrangement for which I can find no other term than that of geographic brutality.

And while I am at it, one other thing happened on this trip. After we had been out a day or two the cabin steward brought us a package and when we opened it we found that it contained three jars of the most delicious jam. The name of the donor was not given, but in unpacking it we unearthed some old envelopes used as buffers to keep the jars from breaking, and on these envelopes was the name of Charles Hall of Sydney. That man had surreptitiously tucked this jam under the wing of the chief steward before the ship sailed from Sydney so that a week later when we embarked at Wellington we should have something to tone up and vary the ship's menu. Verily, I am wondering if those Australians do not lie awake nights planning how they may spring some fresh courtesy on a pilgrim from another land.

In Wellington the minister in charge of Cook Islands, Dr. Pomare, had given me a letter to Judge McCormack, acting resident commissioner at Rarotonga, asking him to extend to me and my family all the courtesies of the administration, so that our stay might be made as pleasant as possible, but on our arrival we found that the Judge was away from Rarotonga attending

to some affairs on another island, so we did not have the pleasure of meeting him. But our visit there was most enjoyable. There are no docking facilities at Rarotonga for large ships and so the Tahiti had to anchor outside and we were taken ashore in small boats. It was rather an exciting experience as the sea was quite high and the boats, towed by a steam tug, rolled and tossed



Native Rarotongan Steering Our Boat.

till they seemed almost to stand on their very ends. But the natives—who are only another edition of the Maoris we had seen in New Zealand, 1,800 miles away—were most expert in handling the craft, and we really enjoyed the trip.

On shore we sauntered around the village—practically a single street running along the shore—and studied the native life. There are probably not one hundred white people on the island, which is a very small island but exceedingly fertile. We saw cocoanuts growing luxuriantly, as well as bananas and oranges, and it really seemed the most productive for its size of any island we had seen in the South Seas. We loaded quite a cargo of cocoanuts for San

Francisco. The natives are quite interesting, and very cordial with visitors. They look at you and smile as you meet them on the street, and if they get the least encouragement they salute you with a hospitable "Good Morning." Altogether life on the island seemed to be a mingling of peace, plenty, lack of ambition, narrowness, indolence and content. It is ideal for those who like it, but as for me, I would climb to the top of one of their loftiest peaks in a week and extending my hands to high heaven would clamor to be taken off.

They were repairing the main road of the village while we were there and coating it over with coral formation from the shore, and among this, as we walked along, we found some of the most exquisite shells we had ever seen. The Collector naturally was in her element, and as a matter of fact, we all turned collectors. I filled my pockets with them and afterward was sorry I had not secured more.

As we lay at anchor a big whale came sporting along and heaved its enormous back out of the water and then flopped its tail in the air, between the ship and the shore. If that chap had taken a notion to come up under one of the small boats plying between the Tahiti and the dock it would have made a scattering, but I have sufficient confidence in the native skill of those chaps who were handling the boats to believe that somehow they would have managed to right them and bring every one safely to shore.

We took on board quite a number of the natives to go to Tahiti to load cargo. The natives of Tahiti are too indolent to work, and are so unreliable that the steamship company finds it necessary to take the Cook Island chaps to Tahiti to handle their freight, and then bring them back by the next boat. During the trip they helped clean decks and work in the hold. They were barefooted, of course, and one day something fell and practically crushed off a couple of toes from two of them. They were apparently very little disturbed, and merely came up to the first officer and, pointing to the toes, made the laconic remark, "Broke." They turned all their work into a frolic, and were always laughing and chafing each other. On this passage also we had a native Tahitian princess, a really beautiful girl, with a wealth of hair, and a truly regal carriage. She had some of the most wonderful gowns, and when she dressed to leave the ship at Papeete she was gorgeous in a flowing garment of the most

delicate pale pink. The natives of all the islands have a great fondness for bright colors, but it seemed to me that the Tahitians were more extravagant in this regard than any we saw on the trip.

One thing in particular impressed me at Cook Islands. I have before spoken of the wonderful blue of the Pacific, but no place in our entire trip of about 15,000 miles on water did we see anything to compare with the color at Rarotonga. It was the deepest of royal blue—a marvelously beautiful sight. We had a German on board, and looking over the side of the ship he said: "I know what hess happened. A ship hess gone town loaded mit blueing." And it certainly looked like it.

Just before the ship sails the natives come on board to sell necklaces and other trinkets. I bought a string of beads from one, and there was another chap who had a large, bulky necklace of shells. I asked him how much he wanted for it and he simply said one word which I couldn't make out. The man from whom I had bought the beads stepped up with a grin and said: "Coat—he wants coat. Ver' cole, Rar'tong'." But I had no coat to trade him, and any how I was afraid the poor chap might get sunstroke if I let him have a coat in that climate. I had nearly baked that day on shore, and I really think he wanted the coat more for ornamentation than because it "was cold in Rarotonga."

Australia and New Zealand have a rigid Chinese and Japanese exclusion act, and the Cook Islands, being under control of New Zealand, keep Chinamen out. In our third class on the ship there were quite a number of Chinese on their way to Tahiti, which is under French domination, and where everything is allowed to land. In Rarotonga no liquor is permitted, which is a very good thing for the natives, but at Tahti it is everywhere. There were a few Chinese women on the boat but during the entire voyage from Wellington to Tahiti—more than a week—they were never seen on deck. For some reason they remained in their cabins, and not till the boat had pulled alongside did they appear. Then they were decked in their best and looked wonderfully clean and neat with their hair done up in a way to excite the envy of their white sisters. There was one little Chinese boy dressed in the height of fashion with a drab suit and little stiff straw hat. He was so small that he did not appear to be much more than out of his swaddling clothes, and was really the cutest little Chink that could ever be imagined. I did so

much want to get a snap shot of him, but when the interpreter approached his father on the subject he declined on the ground of a superstition which they have that the child would never grow any more if a photograph were taken of him. I sympathized with the father, because if that child never grew any more he wouldn't be big enough to do anything in the world except to be exhibited as a midget.

PAPEETE, TAHITI.

Papeete is the capital of the Society Islands, of which Tahiti is the largest and most important. All ships are compelled by the French government to remain in port twenty-four hours, which gives passengers an opportunity of seeing something of the island. Papeete is a town of about 4,000 inhabitants and it is the proverbial motley crowd, mostly natives, with Chinamen, French and a scattering of English and American. The streets are narrow and the houses for the most part low and the yards illy kept. In strolling and driving through the streets we saw a few very beautiful tropical gardens, really wonderful in fact, but the average resident of Papeete does not take advantage of the great possibilities of the place in this respect. It could be made a paradise, but much of it is untidy, and even filthy. The sanitary conditions of the place are far from satisfactory, though a good water supply is piped through the town. There are few sidewalks and everyone walks in the street, which seems to be their chief occupation. The most alert people I saw, aside from the few white men, were the Chinese, who are the chief shop-keepers of the place, and even they did not seem to be doing a very rushing business.

As for the native Tahitian, I went there somewhat prejudiced against him on account of his reputation for shiftlessness. Of all the South Sea Island tribes he is at once the laziest, the serenest, the most aristocratic and most immoral, which is a tremendous statement to make. He has been called the Gentleman of the Pacific, but the man who named him that seemed to overlook the fact that mere aversion to work does not really constitute a man a gentleman. And yet with all of my prejudice against him I must say that he gradually broke it down during my short stay on the Island. He is so cordial, so hospitable, so happy, that he imparts some of it to you, and you are not inclined to stand out long against a man who

seems to get so much out of life with so little effort, and who apparently wishes you could do the same. And then I argued that I too would probably be lazy if I lived there long—only I wouldn't live there long.

But I met one white man there who had not grown lazy and he has been there ten years. Dr. W. J. Williams, the only dentist in the place, was born in Canada, graduated at the R. C. D. S., Toronto, and also at an American college, after which, on account of his health, he sought a warm clime and finally located at Papeete. He has done exceedingly well, and has extensive cocoanut plantations on some islands a couple of hours' sail from Tahiti. But even Dr. Williams will tell you that living on Tahiti has its drawbacks.

The most pretentious hotel at Papeete is the Hotel Tiare, in saying which I am conscious of a very serious abuse of poetic license in using the term "pretentious." It looks much like an ordinary private residence situated in a garden with a fence around it, and the only external evidence that it is a hotel is a small sign on the fence near the gate. The place is conducted by a half caste woman named Lavina, and people never speak of going up to the Hotel Tiare—they say they are going up to Lavina's. This Lavina is a big, good-natured soul who seems to take an interest in all her guests and is known by every one on the island. When I say she is big I mean it. I do not think Lavina ever wore such a foolish thing as a corset, and I should imagine she must have been fully ten feet in circumference at the equator, and would weigh at least 400 pounds. In fact the most of the native and half caste women were quite fleshy, and they all wore dresses without belts—just a sensible loose gown hanging free from the shoulders down. They all run to bright colors, the brighter the better. In walking or driving along the streets the glimpses we got into the homes showed the same predilection for colors, the bright red predominating.

We went up to Lavina's for dinner the night we were there, and had a very substantial meal served out on the porch, which was a great treat. To the sea faring traveler a meal on shore is something to look forward to no matter how varied the ship's menu may be.

It was very hot in town that night and the streets were illy lighted except for the moon, so we walked back to the ship and sat

out on deck where it was comfortably cool till bedtime. We retired early because we were to be up town the next morning at 5 o'clock to attend the market, which is a great institution in Papeete. They hold the market early and get everything out of the way before the extreme heat of the day has set in—in which I think they are wise. I shall never forget that market. Such a motley crowd of vendors and as motley a crowd of buyers, with all sorts and conditions of things to sell. They had meat stalls, and fish stalls, and vegetable stalls, and live chickens tied by the legs and flopping about the floor. Of course there was fruit of all kinds and of splendid quality, put up in tasty woven reed baskets—very tempting. A white man saw us looking at the fruit, and stepping up he said: "Pardon, but if you buy any of this fruit pay them no more than a franc a basket. That is the ruling price." We thanked him—it was so unusual to be guarded against being fleeced because we were Americans. A franc is equivalent to about twenty cents of our money, and for this small sum we purchased about all the fruit I cared to take to the boat. A Chinaman had some fine tomatoes and I pointed to a pile containing half a dozen, and asked: "How much?" "Ten cent," he said. Rarotonga was the nearest port to Tahiti and British money is current there so I naturally produced a sixpence. This was equivalent to twelve cents but the Chink looked at it disdainfully and shook his head. I then began searching my pockets for some French money which of course is the standard coin at Tahiti, and in doing so disclosed an American dime. Instantly the Chink's eyes brightened, and he showed his teeth with a grin. I held up the dime, he grabbed it with a gurgle, and handed over the tomatoes. I had a similar experience at the leading photographer's. He was a Frenchman, and I was having him develop some Kodak films for me. When I went to pay him I handed out some British gold in one hand and some American gold in the other. He started to take the British gold before he noticed the American, but the moment he saw the latter, he dropped the British money in my hand again and seized the American money. I was wholly unable to account for this but it made me a bit more "chesty" when I thought I had some American money in my pocket. And incidentally I was forced to reflect that in all probability our American money would not have enjoyed quite the same respect abroad if our free silver friends

had been successful a few years ago in forcing their policy upon the country.

The fish at the market consisted of many strange varieties, some of them beautifully marked and colored. We saw many like the ordinary gold fish which we keep in glass jars at home, and



Native Tahitian Deformed by Disease.

some of strange and grotesque forms. Many of them were still alive, which is about the only assurance of getting them perfectly fresh in this climate. We were told that most of the fish here was rather soft and not of the same quality as those caught in our northern waters.

One thing I saw on the market that morning which I did not like. I had often heard of the disease elephantiasis, and had seen illustrations in books but had never seen the real thing till now. Sitting around the outskirts of the market were several men affected with the disease, and I am told that it is very prevalent on the island. As every one knows it is an enlargement of the limbs, but I must confess that I had no idea what grotesque and enormous

deformities were produced by it. I am showing two cases of it taken from natives of Tahiti. I talked with one old fellow who was greatly deformed in his legs, and I found him the happiest and cheeriest soul imaginable. He could understand English very well and could talk enough of a broken dialect to make me under-



Elephantiasis.

stand after a fashion. We had great times gesticulating to each other and he considered it quite a triumph when we could make each other understand. After I had given him a particularly long sentence spoken with due deliberation and helped out by many gestures he would beam with delight as he showed me that he understood. And then when he made me follow his remarks he would explode with laughter at our joint achievement. I envied that man in one way. To be philosopher enough to smile when gripped by such a disease as that is to show real courage. I know of no white man who could do it.

C. N. J.

(To be continued.)

CORRESPONDENCE.

A WORD TO THE DISCUSSER OF THE EVENING'S ESSAY.

I have listened carefully and gladly to the essayist who, although perhaps dealing with a hackneyed topic, has nevertheless framed his opinions in terse, well worded sentences, has brought out his points in proper sequence and sat down. (Merited applause).

Now before you arise to discuss this "Paper" let me have a quiet word with you.

You know that your official duty is to discuss that paper—just that.

Has the essayist said all that could be properly said on the subject, for instance, has he recited the multiplication table in good form and correctly, you say (what everybody in the room already knows) thus: "Gentlemen the essayist has recited correctly and fully, and I am in accord with his views. Thank you for your kind attention."—And sit down. (Tremendous applause).

Has he omitted anything or brought out a mooted point, aim your criticism at those points accurately and briefly. Please do not lead us up and down a dry ditch and think it is a trout stream, saying, as for instance, "I agree with the essayist that two times two equals four BUT, notwithstanding his able argument, after years of experience, I think that prophylaxis is the thing and sealing wax is good. I use mush and my success is 98%."

Or, perhaps if you do not intend to speak extemporaneously but have also carefully written out the multiplication table remember that you are likely only to repeat what the essayist will have said, and it is not polite to that gentleman and it is wasting my time. I came to this meeting for facts, new facts, if one may be fortunate, and not for meandering twaddle. Oh! must you go—?

CARL T. GRAMM.

A REVIEW OF DR. BUCKLEY'S REPLY TO MY VIEWS REGARDING THE
ACTION OF FORMALDEHYD.

To the Editor of the DENTAL REVIEW:

Sir:—I must positively refuse to be drawn into a personal controversy in the discussion of this subject. Such an indulgence

could be of no possible value in determining the truth concerning the questions under discussion. In employing this method Dr. Buckley clearly indicates the spirit which prompted him in resorting to this form of attack. If I may be permitted I wish to say, however, in reply to the personal allusions which may be suggestive of anything derogatory, that I trust my past life will show that my conduct has always been in conformity with that of an honorable and respectable gentleman, which requires no defense.

Since Dr. Buckley has expressed his anxiety concerning my degrees, I might state that they are all bona fide. Regarding the reference made to "professional advisors," I can only say that unfortunately I have not been favored with any such assistance; and the same is true regarding helpers. The only man who had any knowledge of my work along this line was my friend Dr. R. A. Stevenson, whom I frequently conversed with upon the subject. I must also state that I was not informed of Dr. Buckley's communication with the Minneapolis Dental Society.

There were some very important reasons why I undertook to express my views upon the action of formaldehyd. First, because the claim that the formation of methyl alcohol and the precipitation of sulphur resulted by the action of hydrogen sulphid upon formaldehyd, was not supported by proof. My discussion of this question was published in the December issue of the *Dental Cosmos*, 1911.

In connection with this question, I wish to say that in experiments where the bubbling of hydrogen sulphid gas into formaldehyd was continued for a period of two hours, it showed no precipitation of free sulphur. Such experiments ought to be of some value in proving that Dr. Buckley's contention is not correct. Why should we not be interested in ascertaining the truth concerning matters of this nature?

Another reason I entered into this work, was because I believed formaldehyd produced much harm and I believe this is especially true when it is employed in teeth with a large apical foramen, as in children's teeth.

Judging from the many letters I have received from dentists in various parts of the United States, I am convinced that I am not alone in the belief that irritation does result from the use of these preparations.

Our literature often contains discussions referring to this

property. (See *Dental Cosmos* for September and October, 1913, pages 957-1062-1067).

Still another reason I expressed myself upon this important question was that I did not believe the use of remedies like formaldehyd, which has harmful properties, was necessary in the treatment of putrescent pulps. After employing the method suggested in the October issue of the DENTAL REVIEW, for a period of nearly two years, I have always found the results to be very gratifying; and after many favorable reports received from other dentists who have used the thymol preparation for some time, I felt safe in recommending the method to the dental profession.

In reading Dr. Buckley's reply appearing in the November issue of the DENTAL REVIEW, I fail to find where he has added anything to show that free sulphur and methyl alcohol result by the action of hydrogen sulphid upon formaldehyd, or that he has shown why the use of Formocresol is not injurious.

On page 1227 Dr. Buckley admits that formaldehyd is productive of much harm if it is allowed to come in contact with vital tissue, where he says, "No one denies that formaldehyd has irritating properties or that it will not produce inflammation (soreness) if the gas comes in contact with the live healthy tissue in the periapical region." Also that it will act upon albuminous tissue. "Neither does any one doubt that albuminous or gelatinous matter is not toughened or hardened when acted upon by formaldehyd." I have interpreted this statement to imply that it is toughened or hardened by the action of formaldehyd, though Dr. Buckley states that no one doubts it is "not toughened."

Further he states, "I have never intended to have the formaldehyde gas, which is constantly generated from the remedy, escape through the apices of the roots." Still Dr. Buckley suggests the use of an anodyne. An anodyne is to alleviate pain. Why an anodyne, if the gas does not reach the vital tissue? On the same page he says, "It was because of this property that I suggested the addition of modifying agents to correct the irritating qualities of the gas." In this statement, Dr. Buckley admits that unless formaldehyd is modified it is harmful, but are the irritating properties modified by the addition of cresol? As another reason why formaldehyd will not cause irritation, Dr. Buckley states, "the remedy sealed in a putrescent canal will act upon the intermediate and end-

products of pulp decomposition." This action I presume prevents the gas from evading the apical tissue. I would like to know how the amount of formaldehyd necessary to chemically change the intermediate and end-products is determined? If an excess of the remedy is employed, how can the gas that is constantly being generated be prevented from making its escape to the periapical tissue; or is there any reason why the gas can not escape through a large foramen? How can cresol here act as an anodyne when it does not possess volatile properties? Without this property it is impossible for the agent to reach the vital tissue and exert this action. Anodynes are used for reducing pain caused by an irritant, not for "altering" the destructive properties of drugs.

Dr. Buckley says, "if the infection in the periapical region is not too severe, sealing of the remedy in the canal hermetically will correct the soreness," but maintains that formaldehyd gas does not "escape through the apices of the roots in these cases."

It would be of much interest to learn upon what theory Dr. Buckley bases the claim that formaldehyd cannot escape through the apices of the roots where no putrescent pulp tissue is present. I am aware that he suggests diluting the remedy with cresol for these conditions, but even though it is diluted, it does not prevent the gas from being generated and reach the affected tissue in a gaseous state; it will therefore be reduced only in quantity and not in quality by the dilution. It is very apparent that when formaldehyd is treated in this manner it does not lose its destructive properties, but only reduces the percentage of gas in the remedy. Therefore the formaldehyd escaping through the apex is equally destructive to the same volume of gas contained in a forty per cent solution.

For Dr. Buckley to merely assert that the destructive properties of formaldehyd is altered by the addition of cresol, is by no means proof that this occurs. He must offer some evidence to sustain his claim.

Many dentists maintain that irritation does result from the use of formaldehyd preparations. When irritation is produced, it occurs in the vital tissue in the region of the apex as I stated in the October issue of the DENTAL REVIEW, page 997.

Dr. Buckley endeavors to prove that a coagulation by the use of Formocresol does not occur. He presents an argument which he previously offered, to show that decomposed pulp tissue is not

coagulable, which is in no way applicable to the conditions I have referred to. What was said by Dr. Buckley upon this question, only shows that I was not the first to call attention to the fact that albumin could be coagulated by substances used in root canals, for which I have never made any claims. Also that decomposed albuminous substance will not coagulate. This I have never questioned. The extravasated fluid to which I refer, is not analogous to decomposed albuminous substances, for it has not undergone decomposition.

Dr. Buckley says, "How absurd to assume that a tooth with nothing in the canal except the remedy sealed therein, implanted in a bottle filled with egg albumin is analagous (?) to one found in the mouth." This is an analagous in so far as the action of formaldehyd upon the albuminous substance resulting from inflammation; especially in roots that have a large apical foramen. Dr. Buckley says, "In the interest of truth, I will show that his 'idea' does not amount to a great deal, to say the least." As proof he offers the following, "There are many who assert that albumin, though present, does not prevent the penetration of coagulating agents, and that such takes place throughout the pulp-chamber and root canal as well as in the dentinal tubuli." Further he states, that "These experiments prove conclusively that coagulants will penetrate the putrescent mass of a root-canal." Now if this occurs it can readily be seen that the formaldehyd penetrating this coagulated mass will surely reach the vital tissue, both through the dentinal tubuli, and through the coagulated mass extending to the apical region as shown in Fig. 3 in the October DENTAL REVIEW, which is the "idea" referred to by Dr. Buckley. Surely such a condition is productive of harm. While Dr. Buckley here states he does not believe such a condition is harmful, he contradicts this on page 1232 where he says, "If Dr. Grove's drawings represented anything nearly like the actual conditions, it would be a serious matter." Again referring to the coagulated substance, page 1234, Dr. Buckley says, "If he is not yet willing to accept the results of my laboratory experiments and still maintains that coagulated albumin around the root-ends results from using Formocresol," and requests me to read the following from Stevens' Fourth Edition, "Though very diffusible, formaldehyd has little penetrating power; it cannot be considered, therefore, except under the most favorable conditions, more

than a surface disinfectant." On page 1232 Dr. Buckley informed us the penetration of coagulating agents would not be prevented from extending through a coagulated mass, or even through the dentinal tubuli; I cannot determine from these contradictory statements whether he means formaldehyd does penetrate or does not. At any rate it does not "show" that my "idea" is so trivial. For if it does not penetrate the coagulated mass, it can be seen as I stated in the DENTAL REVIEW, "It will be impossible to further treat the pathological conditions existing in the region of the apex." If it does penetrate the coagulum, it will as stated above, come in contact with vital tissue. The action of any agent possessing irritating properties in such conditions, cannot be anything but deleterious, seriously interfering with tissue repair, reducing the vitality of the tissue and thus gradually rendering it to a condition where they will more easily yield to the action of microorganisms.

To anyone questioning that formocresol will coagulate the fluid referred to in my previous writings, I would suggest that a small portion of formocresol be placed into a root canal containing the fluid, which will readily prove whether or not my claims are correct.

On page 1233 Dr. Buckley asserts that gases resulting from pulp decomposition are not of "sufficient importance to be given much consideration, other than the pressure they might possibly produce if confined for a time in a closed canal." This statement is hardly in accordance with Dr. Buckley's previous views, for he has often emphasized the importance of employing a remedy that would dispose of the gases. Why is it not important that we have a correct understanding of the chemistry of pulp decomposition? I believe the better understanding we possess of these conditions, the more intelligently will we be able to deal with them.

Dr. Buckley states that in my article appearing in the *Dental Cosmos*, I contend, "that formocresol does not act chemically upon the contents of a putrescent canal." In the article referred to, I question the presence of ammonia gas in the medium which Dr. Buckley states exists throughout pulp decomposition, and I question the possibility of ammonia and hydrogen sulphid being formed during the treatment when formaldehyd is present in the pulp chamber. Therefore I maintain a chemical reaction could not occur. I also questioned Dr. Buckley's belief as to the precipita-

tion of sulphur, and the production of methyl alcohol by the action of formaldehyd upon hydrogen sulphid. Does the fact that formaldehyd destroys the disagreeable odor of decomposed pulps, prove that methyl alcohol and free sulphur result? Dr. Buckley says, I "ought to know that there is not enough sulphur in combination with the hydrogen to be precipitated as a 'yellow precipitate.'" To this statement I wish to say, that if sulphur is present in the solution, it will precipitate if the reaction claimed by Dr. Buckley occurred, especially where hydrogen sulphid gas is passed into formaldehyd for two hours.

Dr. Buckley endeavors to prove that his theory is correct by showing that the odor of hydrogen sulphid is destroyed by the addition of formaldehyd, and by quoting from Stevens, "It unites readily with hydrogen sulphid." Here Dr. Buckley fails again to prove that his theory is correct. It will be observed that Stevens does not state that either of these products result from the reaction.

Hoffmann states trithiomethylamine is formed by the action of formaldehyd upon hydrogen sulphid which I referred to in my discussion upon this subject before the Minneapolis District Society in October. If hydrogen sulphid is present during the treatment of putrescent pulps where formaldehyd is employed, it is reasonable to suppose that this reaction will occur. $3 \text{CH}_2\text{O} + 3\text{H}_2\text{S} = (\text{CH}_2\text{S})_3 + 3\text{H}_2\text{O}$.

In reply to what Dr. Buckley said pertaining to the chemical reaction taking place in the compounding of the preparation I have suggested, I wish to say that I believe it is possible for a portion of the chloral hydrate to be decomposed under the influence of light and air, thus liberating free chlorin which would unite with calcium hydroxid and still have sufficient "original ingredients" to bring about "a separate distinct action."

Dr. Buckley states that my "reason for adding calcium hydroxid rests upon the supposition that it is important to neutralize the carbon dioxid." If he will read on page 1003 of the DENTAL REVIEW for October, 1913, he will find that I state "It will be observed that chlorin is given off; add calcium hydroxid in powder form until the odor of chlorin is overcome," which is an important reason why calcium hydroxid should be added. But since it is found that if chloral hydrate is in good condition, and when the

influence of light and air is prevented, no such change is likely to take place, I suggested omitting the calcium hydroxid in a paper I read before the Minneapolis District Society in October, from which I wish to quote, "In view of this I would suggest the advisability of omitting the calcium hydroxid for the results obtained by the use of the mixture of chloral hydrate and thymol are equally satisfactory." This you will observe, was before Dr. Buckley's reply appeared.

Dr. Buckley here questions my English, "Does Dr. Grove mean that the chloral hydrate has the affinity for the 'wide range' or for the 'ammonia and sulphur compounds;'" I wish to say, that I mean the chloral hydrate has a great affinity for a wide range of ammonia and sulphur compounds, which I maintain is correct English.

Dr. Buckley states that the remedy I have suggested contains "only chloral hydrate and thymol," possessing "no virtue over my Thymol Compound." This statement seems rather ambiguous in view of the fact that chloral hydrate possesses properties of value which are wanting by the ingredients of the Thymol Compounds. Not knowing how this may compare with the Thymol Compound, I wish to offer some information that discloses the fact that thymol is far superior, as a germicide at least, to formocresol for the treatment of putrescent pulps. In the February issue of the *Dental Cosmos*, page 234, there appears a translation showing the results of Professor Boennecken's investigation of which I wish to quote, "The experiments carried out by Boennecken, in order to determine the absolute and lasting sterility of a root-canal treated in the manner described, are very encouraging, and his method seems to offer the advantages of simplicity and saving in time over other much-recommended methods. In a series of 243 experiments in teeth with gangrenous pulps, thymol proved to be the strongest disinfectant, eugenol the weakest. With concentrated alcoholic solution of thymol it was possible to sterilize within thirty seconds a gangrenous and exceedingly putrid root so completely that a bouillon culture remained clear for eight days, showing that all spores, even within the dentinal tubuli, had been killed. Aqua regia stands second in disinfecting power, with 40 per cent, formalin next. Putrescent pulps which had been removed in their entirety from extracted teeth were completely sterilized within sixty seconds by thymol, aqua regia, and formalin alike. Far inferior to these three

antiseptics are tri-cresol-formalin and caustic soda, which are about equal in their disinfecting power, and are closely followed by carbolic acid, chloral hydrate."

If the results of these investigations are accepted by Dr. Buckley as being of any value he surely must admit that formocresol is not necessary for the treatment of putrescent pulps.

On page 1236 Dr. Buckley accuses me of forgetting the remedy at the second sitting, but this is not correct. On page 1004 of the *DENTAL REVIEW* for October, 1913, I state, "If cresol is employed with a glycerin to make a ten per cent solution, it will readily mix with the fluid. It must not be forgotten that this product is of an albuminous nature, therefore substances which will coagulate albumin should not be employed in the treatment of these conditions. The cresol preparation will also be found suitable in this respect. After the use of sodium and potassium I seal this remedy in the root canal."

In reply to Dr. Buckley's question referring to the need of using Schreier's paste, I can best answer this by repeating what appeared in my article in the *DENTAL REVIEW* for October, 1913, page 1003, "There are two very important reasons why substances of this nature should be employed for the correction of these conditions. First, because all the decomposed pulp tissue can be chemically transformed to substances which can easily and thoroughly be removed which is not possible by mechanical means only. And the second reason is because sterilization is made possible after the removal of these by-products."

It hardly seems necessary that Dr. Buckley should request information concerning a need so apparent as the use of this paste.

Dr. Buckley states that I have suggested only one remedy. He evidently has overlooked the cresol and glycerin preparation. He also states that chloral hydrate and thymol "has been used by a great many dentists in the treatment of teeth." I notice that Dr. Buckley does not say it has been used for the treatment of putrescent pulps. If it was ever before suggested for this purpose, I was not aware of it. Since Dr. Buckley does not state in his book, on page 141, that the mixture has ever been used for the purpose I suggested, I cannot see why he deems it necessary to refer his readers to this page.

Here again Dr. Buckley wrongfully accuses me when he says,

I "have not published the complete formula," and that I "have not offered the pharmacy involved." On page 1003, of the DENTAL REVIEW, for October, 1913, I stated, "In preparing this compound, equal weights of thymol and chloral hydrate should be taken and triturated, which makes a clear liquid. It will be observed that chlorin is given off; add calcium hydroxid in powder form until the odor of chlorin is overcome, filter, or allow the solution to stand until it is clear, and decant the clear liquid. If a few drops of ethyl alcohol is added to the solution it will prevent crystallization around the mouth of the bottle."

In conclusion I wish to say, that if Dr. Buckley had shown in his reply that sulphur and methyl alcohol would result by the action of formaldehyd upon hydrogen sulphid, he would have proven his chemical theory; and if he had shown that it was impossible for formaldehyd to escape through the apical foramen to produce irritation, and that coagulation of the fluid resulting from inflammation will not occur, with some evidence that would show that formocresol is superior to the method I have suggested, I would then be able to see the imperfection of my work; but what was offered against my views by Dr. Buckley does not appear to be sufficient reason for making any change in my ideas. I have, however, found it necessary in places to repeat and explain more fully the meaning set forth in my previous writings. While my views may not be altogether free from errors I will leave to the decision of my unbiased readers whether or not my work is a "sham."

Sincerely yours,

St. Paul, Minn.

CARL J. GROVE.

PRACTICAL HINTS.

Edited by J. E. Schaefer, D. D. S.

(This department is for busy readers. We want short articles containing practical hints—the shorter the better. No article must exceed 200 words, unless of exceptional merit. Every dentist has some useful hint that has been of value to him, and if he will only put it in print it may be of equal value to others. That is what this department is for. Due credit will be given for every article sent. Address J. E. Schaefer, 1745 W. Harrison St., Chicago, Ill.)

Prevent Mirror from Steaming:—A little glycerine on mouth mirror will keep steam from forming on same when working.—*J. H. Pearce, D. D. S., Peoria, Ill.*

A Quick Method of Adjusting an Inlay:—A quick and accurate way of adjusting a gold inlay, especially a large compound, is to heat same to a dull red, then cool without dropping in acid. Insert in cavity with slight rocking movement. Any prominent point will make a bright mark on the oxidized gold, showing points to be relieved.—*D. A. Hare, D. D. S., Chicago.*

Disposing of Excess Amalgam:—After removing matrix from tooth, filling being amalgam, a piece of rubber dam drawn taut, and passed between the teeth, and over the margins, is an excellent way to remove excess amalgam and smooth up filling.—*J. H. Pearce, D. D. S., Peoria, Ill.*

Care of Deciduous Teeth:—The use of copper cement in the fissures and of plaque destruction by means of ribbon floss and some abrasive powder between the deciduous molars is practically all we need to start with the care of the little child's teeth, provided we get them early enough.—*J. N. Pike, D. D. S., Minneapolis, Minn.*

A Gasoline Cold Weather Suggestion:—I put the tank to my Sams outfit in a pan or kettle of hot water on cold mornings, and when real cold I sometimes bend a piece of metal over the pipe from the air tank and put the alcohol lamp under it, this helps to warm the air entering the tank, and vaporizes the gasoline better.

This idea was so simple that I never mentioned it, thinking likely that others were doing it too, but I find by talking to a number that it was new to them. This will be found very convenient for those who have to use gasoline and live where they can not get anything but low grade gasoline, and undoubtedly mark a saving in both patience and profanity.—*E. B. Stoughton, D. D. S., Rogers, Ark.*

Grind Artificial Teeth:—No artificial teeth should be placed in the mouth with cusps more prominent than the natural ones in the mouth. This is definite rule that is not always observed, because often the inexperienced tries, so he thinks, to improve on nature.

At 35 years, the teeth usually show some wear. At 45 years they show considerable wear. At 65 years the teeth are worn flat with slight depressions where the cusps have been. At 45 years these depressions in the teeth are quite deep, owing to the fact that

the dentin beneath, where the cusps were, is so much softer than the enamel at the periphery of the cusps.—*W. C. Dalbey, D. D. S., Du Quoin, Ill.*

How to Prevent Warpage of Gold Plate:—In the vulcanization of the rubber on a gold base plate, it is not at all uncommon to find a warpage of the gold base plate. No doubt this warpage is due to the changes in the plaster used in flasking the case. This warpage in the base plate can be overcome by vulcanizing with the gold base plate over the die on which it was swedged; which is a far better means than trying to place the base plate on the original plaster model, from which the dies were made, because this model changes through drying out, etc. If necessary, the die may be cut down with a hack saw; the die metal used is Dr. Haskell's formula of babbit metal.—*M. L. Schmitz, D. D. S., Chicago.*

Repairing Inlay Margins:—Often compound inlays are satisfactory in all features except the gingival margin. This fault can be entirely corrected by finishing the inlay ready for cementation, removing it, cleansing and drying the cavity. Then placing a small amount of thin cement or cavity varnish on the gingival wall, a suitable pellet of foil is flattened and adjusted to conform to the discrepancy and to extend beyond the margin. The inlay is placed in the cavity and malleted to position condensing the foil and removed. The cementation is then completed and the foil projecting over the gingival margin is better condensed by hand pressure and finished with a strip. This gives a filling as perfect as ever obtained with tin or non-cohesive gold, materials ranked as ideal for the purpose.—*Clarence Simpson, D. D. S., St. Louis.*

Objections to Bismuth Paste:—Bismuth paste is very greatly recommended by some in dentistry; and by some surgeons also for general surgery. Others instead object strongly to its use. The paraffine and the vaseline (the basic substances of this paste) being minerals, are not absorbed by the tissues and therefore are used as cosmetics in general surgery; whilst in dentistry it is necessary to use substances that can be absorbed so that the basic materials of the paste must be animal or vegetable fats and oils. Subnitrate of bismuth, so large a constituent of Beck's paste, is absorbable, and

though it has no greater bactericidal power than the iodic preparations, may bring on a serious poisoning of the system, manifesting itself in the shape of ulcers of the oral mucous membrane, by headaches, nausea, diarrhea, necrosis of the bone, and may even lead to the death of the patient.—*Dr. Angelo Chiavaro, Rome, Italy.*

Valuable Hints on Plate Work:—Dr. Haskell calls special attention to those flat lower jaws, which he terms the problems of the dentist, for the reason that absorption has taken place to such an extent, the lingual muscles are attached to the margin of the jaw, consequently the plate cannot be worn over the lingual margin as it is lifted by the tongue.

This he demonstrates by placing the end of his finger just over the margin of jaw at the corner of the mouth, holding it tight and raising the tongue, the finger is violently ejected.

To partly remedy this difficulty, flanges are placed on the margin of the gums, extending from first bicuspid about one-quarter inch wide, and between margins of plate and necks of the teeth, upon which the cheeks rest and help hold the plate from slipping.

Always telling the patient these plates are far more liable to irritate the membrane than an upper plate. If it does, they cannot eat, but come to the dentist for relief with plate in the mouth, so the irritated spot can be seen. While it is readily seen, it is not always easy to locate it on the plate. Place a little moist whiting on the spot, put in the plate, upon removing, the spot is indicated by the whiting.

He calls attention to the many failures, arising from faulty articulation. The six anterior teeth should *never* come in contact under any conditions, the pressure being upon the bicuspids and first molars and exact on both sides.—*L. P. Haskell, D. D., S., Chicago.*

MEMORANDA.

[Society notices will be given insertion in this department free of charge. Subsequent insertions will be charged for at the rate of \$2.00 an inch.]

ARIZONA STATE DENTAL SOCIETY.

The following officers were elected at the fifth annual session of the Arizona State Dental Society in Phoenix, November 5, 6, 7, 1913: President, W. A. Baker, Tucson; vice-president, J. L. O'Connell, Phoenix; secretary-treasurer, H. H. Wilson, Phoenix.

MINNESOTA STATE DENTAL ASSOCIATION.

The thirty-first annual meeting of the Minnesota State Dental Association will occur in Duluth, August 6, 7, 8, 1914, at which time the officers of the Society unite with the Duluth men in promising a most instructive and enjoyable meeting. Benjamin Sandy, Secretary.

NORTH DAKOTA BOARD OF DENTAL EXAMINERS.

The next meeting of the North Dakota Board of Dental Examiners will be held at Grand Forks, North Dakota, January 13th, 14th, 15th and 16th, 1914. All applications for examinations must be in the hands of the Secretary by January 3rd, 1914. For further information apply to F. A. Bricker, Secretary, Fargo, N. D.

ILLINOIS STATE DENTAL SOCIETY.

The fiftieth annual meeting of the Illinois State Dental Society will be held at Chicago, Hotel La Salle, March 23, 24, 25, 26, 1914. Chairman of Chicago Program Committee, Dr. Geo. N. West, 32 N. State St., Chicago; Chairman Exhibit Committee, Dr. P. B. D. Idler, 209 S. State St., Chicago. Dr. Henry L. Whipple, secretary, Quincy.

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

The National Association of Dental Faculties will meet in Buffalo, New York, at 10:00 A. M. on the morning of January 26, 1914. This is in accordance with the resolution adopted at the last annual meeting to meet in conjunction with the Institute of Dental Pedagogs. The Executive Committee will meet at 9:00 o'clock on the same morning.

SIXTH INTERNATIONAL DENTAL CONGRESS.

Section of Oral Surgery and Surgical Prosthesis. The subjects for discussion are: (1) Surgical Prosthesis of the Jaws. (2) Late results of Cleft Palate Operations. (3) Treatment of Dental and Dentigerous Cysts. One morning will be devoted to each subject, the rest of the time will be devoted to papers on subjects of surgical interest in the mouth. The Committee of the Section is desirous of obtaining names of gentlemen willing either to discuss the subjects reported on, or to read papers of surgical interest no matter how short. Harold P. Aubrey, Hon. Sec., 40 Curspan St., London, W.

THE CANADIAN DENTAL ASSOCIATION.

This association will meet in Winnipeg, Manitoba, May 26, 27, 28, 29, 1914. The Manitoba members are making great preparations to entertain the profession from the other provinces and from the United States. Winnipeg hospitality is proverbial and those who attend the meeting may be

assured of a good time in addition to the benefits to be obtained from the scientific features of the meeting. This is the first time the association has met west of Ontario, and it should bring out a record attendance. Full particulars of the meeting may be obtained by writing the president, Dr. G. F. Bush, 527 Main street, Winnipeg, Manitoba.

MINNEAPOLIS DISTRICT DENTAL SOCIETY.

The Minneapolis District Dental Society will hold its annual meeting at the Masonic Temple, Minneapolis, January 16-17, 1914. From the data now at hand, this promises to be a gathering of many of the best men in the country. We have succeeded in obtaining the services of such prominent men on our program as Dr. W. H. De Ford of Des Moines, Dr. C. M. Work of Ottumwa, Dr. M. L. Ward of Ann Arbor, Dr. L. P. Haskell, Dr. Grace Rogers Spalding of Detroit, Dr. Adolph Gropper of Milwaukee and Dr. D. M. Graham of Detroit. We cannot help but feel that this meeting will afford a clinic really worth while and accordingly extend a most cordial invitation. A. A. Zierold, secretary.

RECENT PATENTS OF INTEREST TO DENTISTS.

- 1,063,650. Independent standard for supporting dental engines, A. W. Browne, Prince Bay, N. Y.
- 1,063,523. Tooth brush, Louisville, Ky., W. T. Farrar.
- 1,063,376. Making porcelain inlays, F. H. Nies, New York, N. Y.
- 1,063,282. Handpiece for dental machines, C. E. Northrop, Thorsby, Ala.
- 1,063,214. Tooth brush, J. T. Rankin, Los Angeles, Cal.
- 1,064,635. Artificial tooth, J. A. Gardner, Memphis, Tenn.
- 1,064,331. Dental syringe obtundor, T. N. Iglehart, San Francisco, Cal.
- 1,064,404. Orthodontist's pliers, W. E. Walker, New Orleans, La.
- 1,064,963. Interchangeable flat back front tooth, H. C. Dance, York, Pa.
- 1,065,256. Fountain tooth brush, H. C. LaMar, Marrison, Ohio.
- 1,065,351. Machine for surgical and oral cleaning, S. G. Fyfe, Waukegan, Ill.
- 1,066,360. Repairing dental plates, A. C. Alexander, Kahoka, Me.
- 1,067,929. Blow pipe, A. G. LeChatelier, Marseilles, France.
- 1,067,015. Dental broach, W. W. Fowler, Riverdale, Md.
- 1,066,691. Amalgam mixer, F. M. Willis, Ithaca, N. Y.
- 1,068,870. Dental apparatus, F. B. Egger, Goppingen, Germany.
- 1,068,698. Dental flash, E. O. Pieper, San Jose, Cal.
- 1,068,952. Suction plate for artificial teeth, H. Vigano, Wilmersdorf, Germany.
- 1,067,571. Dental tool guard, J. H. Abbott, Philadelphia, Pa.
- 1,067,572. Mouth prop, J. H. Abbott, Philadelphia, Pa.
- 1,067,696. Dental tool, F. W. Wallace, Chattanooga, Tenn.

Copies of above patents may be secured for fifteen cents each, by addressing John A. Saul, Solicitor of patents, Fendall Building, Washington, D. C.

THE PANAMA PACIFIC DENTAL CONGRESS.

The Committee of Organization of the Panama-Pacific Dental Congress is pleased to greet the dental profession of the world with the announcement that now, twenty months before the date of opening August 30, 1915, the Panama-Pacific Dental Congress is so well advanced in the work of organization that the ultimate success of the Congress is fully assured.

Executive Committees in almost every State and Country in the world are giving publicity to the Congress, securing memberships and soliciting contributions to its program.

The officers of the ten sections into which the program of the Congress is divided, have been selected, and the list includes many men of world wide prominence, and recognized ability, and under their supervision a program is being prepared which will outrank in scientific value and literary excellence the program of any previous Congress.

Fifteen hundred front feet of space has already been reserved by manufacturers and dealers who will present to the Congress the greatest exhibition of dental wares and appliances, and the most comprehensive manufactures clinics ever assembled, and the list of exhibitors is still far from complete, and is increasing in number every week.

The entire Congress, Academic sessions, exhibits and clinics, will be held under one roof, in ample accommodations, in the new Auditorium now being erected in San Francisco's Civic Center, an Auditorium which, in size, architectural beauty, and peculiar fitness for the purposes it will serve, will rank with the best of similar buildings yet erected.

Letters received by the Committee from every country in the world evince the wide-spread interest already manifested in the Congress and assure a large attendance.

The Panama-Pacific International Exposition will attract the people of the world to San Francisco in 1915; the Panama-Pacific Dental Congress will bring together at the same time the best the dental world has of men, methods and materials; to miss the Congress will be to miss the opportunity of a lifetime to become familiar with modern dentistry in all its branches.

The Committee or Organization extends a hearty New Year greeting of good wishes to the dental profession, and invites it to be present in San Francisco, August 30 to September 9, 1915.

19 Hanover Square, London, W.

SIXTH INTERNATIONAL DENTAL CONGRESS.

London, August 3 to 8, 1914. Patron: His Majesty the King.

International Congress Museum—Sections of Museum: (1) Dental Anatomy, Histology and Physiology. (2) Dental Pathology and Bacteriology. (3) Dental Surgery and Therapeutics. (4) Dental Physics, Chemistry, Radiography and Metallurgy. (5) Dental Prosthesis. (6) Orthodontics. (7) Oral Surgery and Surgical Prosthesis. (8) Anaesthesia. (9) Oral Hygiene, Public Instruction and Public Dental Services. (10) Dental Education.

Officers: Chairman, Mr. A. Hopewell-Smith, L. R. C. P., M. R. C. S., L. D. S.; Hon. General Secretary, Mr. F. N. Doubleday, L. R. C. P., M. R. C. S., L. D. S.

Hon. Curators: Mr. H. P. Aubrey, L. R. C. P., M. R. C. S., L. D. S. (Oral Surgery). Mr. C. F. Peyton Baly, L. R. C. P., M. R. C. S., L. D. S. (Oral Hygiene, Etc.) Mr. F. Bocquet Bull, L. D. S. (Dental Education). Mr. F. N. Doubleday, L. R. C. P., M. R. C. S. (Dental Surgery). Mr. E. B. Dowsett, L. R. C. P., M. R. C. S., L. D. S. (General). Mr. A. Hopewell-Smith, L. R. C. P., M. R. C. S., L. D. S. (General). Mr. A. E. Ironside, L. R. C. P., M. R. C. S., L. D. S. (Physics, Etc.). Mr. S. P. Mummery, L. R. C. P., M. R. C. S., L. D. S. (Pathology). Mr. J. Lewin Payne, L. R. C. P., M. R. C. S., L. D. S. (General). Mr. A. T. Pitts, L. R. C. P., M. R. C. S., L. D. S. (General).

NATURE AND SCOPE OF THE MUSEUM.

It is intended that the Museum shall be an International Collection of objects of interest, and be representative of every Section of the Congress. Its nature and scope include the following:

(1) Specimens showing the Evolution of Tooth Form and of the Dentition of Man. Histological Preparations bearing upon recent research.

Exhibits illustrating the Chemical Composition and Physiological Action of the Saliva.

(2) Specimens of Morbid Conditions of the Teeth, Palate, Gums, and Jaws, such as Odontomes, Dental and Dentigerous Cysts, New Growths, Diseases of the Periodontal Membrane, Etc. Photomicrographs of Oral Micro-Organisms, and Cultures of Micro-Organisms in Test Tubes or in Petri Dishes. New Bacteriological Apparatus and Appliances.

(3) Specimens of Teeth, Gums, and Jaws affected by "Pyorrhoea Alveolaris." Microscopical and Lantern Slides of the same. Exhibits of Various New Methods of "Inlaying" Cavities in Teeth. Exhibits of New Methods of "Crowning" Teeth.

(4) Radiographs of the Normal Dental Tissues, and of Diseases of the same and Associated Parts.

(5) Exhibition of various kinds of Articulators. Specimens showing the various Methods of "Pressure Casting." Specimens showing modern forms of Continuous-Gum Work.

(6) Models showing Abnormalities in position of the Teeth, and Appliances for the correction of the same.

(7) Specimens illustrating Methods of Dealing with Surgical Conditions of the Teeth and Jaws, including Cleft Palate, Harelip, Fracture and Resection of the Jaws.

(8) Specimens illustrating the History and Evolution of Anaesthesia.

(9) Photographs, Charts, Diagrams, Specimens, and Statistics of School Clinics. Methods of the Instruction of the Public in the principles of Oral Hygiene.

(10) Instruction Forms, Charts, Diagrams, Specimens, and Demonstration Models used in relation to Dental Education. The Specimens will include those employed for teaching purposes, and also Specimens of Work of both Students and Pupils, completed in accordance with the definite courses given.

(11) Historical Objects of Interest, such as Books, Instruments, Pictures, Etc.

REGULATIONS.

(1) Intending exhibitors must give full information with regard to the exhibits suggested for inclusion in the Museum on the application form supplied overleaf. Exhibitors are requested to *send in the Application Forms as early as possible*. Those received after June 30, 1914, cannot be considered, and lists of exhibits sent after this date cannot be printed in the Official Catalogue.

(2) All exhibits must be received, properly packed (see below), registered and carriage paid, at the University of London, South Kensington, London, S.W., on or after Monday, July 13, and before July 20, 1914.

(3) The Committee has the absolute right of acceptance or refusal of the exhibits.

(4) The Committee reserves to itself the right of arranging the exhibits.

(5) The Committee will be responsible for the proper exhibition of the several exhibits, and for their secure packing and dispatching on return. All exhibits will be insured, and any claim for compensation for damages or loss must be made within three months of the closing of the Museum.

(6) Any exhibitor making a communication to a Section may arrange with the Hon. Curator of that Section for his specimens to be available at the Sectional Meetings, in which case the exhibitor shall be responsible for the safe return of his exhibit uninjured.

(7) No specimen may be removed from the Museum cases without the consent of the Committee.

INSTRUCTIONS FOR SENDING SPECIMENS.

(A) All specimens of a brittle nature should be *securely packed* in wooden boxes, *on the lid of which the name and address of the exhibitor should be painted or written*. On the inside of the lid a written list of the contents should be affixed.

(B) In the case of wall diagrams and other objects of a non-brittle nature, parcels should be made, and the inscriptions should be affixed to the paper covering as under A.

(C) *Each specimen should have some distinctive label attached to it, in order that it may be identified, and should be numbered according to the Section of the Museum in which it is to be placed.*

(D) The box should have a large label nailed on, with the address as follows, legibly written upon it:—

SIXTH INTERNATIONAL DENTAL CONGRESS (LONDON, 1914)

Section..... (Please specify. Number of Section).

Mr. F. N. Doubleday, Hon. Secretary, International Dental Museum.

University of London, South Kensington, London S.W.

Application and Entry Forms may be obtained by writing Mr. A. Hope-well-Smith, 19 Hanover Square, London, W., England.

DEATH OF DR. GEORGE W. COOK.

Dr. George W. Cook of Chicago died suddenly of apoplexy at his country residence, Hebron, Indiana, on December 21, 1913. He was ill only a few hours, and the news of his death came as a distinct shock to his many friends. Lack of time and space prevents us from giving an extended notice at this time, but we can only say that Chicago has lost one of its most scientific and lovable men.



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No. 2

ANKYLOSIS OF THE MANDIBLE.*

BY V. P. BLAIR, M. D., ST. LOUIS, MO.

My object in presenting this subject of ankylosis or chronic limitation of movement of the lower jaw is to emphasize the fact that this is by no means an unexplored field and that sufficient work has been done and a sufficient number of cases have been reported to standardize the treatment of the various groups of cases of this class. Both our review of the literature, and observations made upon our own cases have convinced us that practically all of these can be relieved and that when properly operated this relief is permanent; restoring an open mouth and a functional lower jaw. The advanced age at which some of these cases present themselves, and the length of time the ankylosis has persisted would alone be sufficient reason for a broad presentation of this subject.

In this presentation I will take up certain points as exemplified in the general literature, citing our own cases and ideas only when they are pertinent.

AGE OF THE PATIENTS AND THE DURATION OF THE FIXATION.

In the reported cases the age at which the patients were treated varied from twenty-two months to fifty-seven years. A little over 25 per cent of these patients were ten years old or under, while half the remainder were over twenty years; and cases between thirty and forty years are by no means rare. Our youngest operated case was five years old at the time we did a double excision of the condyles. The oldest was about sixty when he came for treatment.

EXCITING CAUSE AND AGE AT WHICH IT OCCURRED.

The age at which this took place varied considerably, but in the great majority of cases where the age was given it was under ten years. In one case injury at birth was the supposed cause. By

*Read before the Wisconsin State Dental Society, July, 1913.

far the most common single cause was trauma; this accounting for nearly 50 per cent of all cases. The great majority of these injuries were not open wounds and by far the most common form of injury was a blow or fall on the chin.

Next to injury comes scarlatina, usually with suppuration in or about the joint, which accounted for about one-fifth of all the cases.

Following in frequency is suppuration in or about the joint or otitis media, the specific cause not being stated. In a few cases the suppurative focus started about a tooth, among the other infectious diseases typhoid was the most prominent factor but pneumonia, measles, variola, diphtheria, syphilitic ulceration and undiagnosed febrile disturbances are mentioned in different cases.

In one of our cases the exciting cause was, in all probability, a gonorrheal arthritis; as the child had a gonorrheal ophthalmia at the same time as the arthritis. Rheumatism and "rheumatoid arthritis" are put forward as causes, while noma and mercurial stomatitis account for a few cases. We have seen several cases with multiple joint lesions that would come under the heading of hypertrophic arthritis or rheumatoid arthritis.

CHARACTER OF THE ANKYLOSIS AND ITS CLINICAL DEVELOPMENT.

In the cases drawn from the literature bony ankylosis would be inferred as the cause in the great majority of the cases. Next in frequency are fibrous bands in the joint while cicatricial bands in the cheek comes next. In one case a scar band attached to the coronoid process is given as the cause, while in another a tumor was attached to the zygoma.

Among our cases, two were solid bony ankylosis on one side and in these cases the coronoid process and the condyle were represented by a bony mass fused to the base of the skull with no sigmoid notch and no glenoid fossa. In four of them there was a short close fibrous ankylosis of the joint with considerable change about the condyle and the coronoid. In most the sigmoid notch was entirely absent, the ramus being continued up in its full width; ending in a broad, flat rough base that was closely attached to a similar flat surface at the side of the glenoid fossa. In two there was apparently less bony change in the joint. In one case there was considerable limitation due possibly to the dislocation of the inter-articulation of the interarticular fibro-cartilage. It came on sud-

denly while an injection was being made for a facial neuralgia and continued without change. In one case the ankylosis was apparently due to a very large strong styloid process that impinged the posterior border of one ramus of a receding jaw. Cicatricial bands in the cheek limited the opening in three cases.

The development of the ankylosis has, in all of our cases, been gradual. There was the injury, or the arthritis, and later it was noticed that the amount of opening was limited. Gradually this decreased until there was a complete or almost complete closure. The case of supposed dislocation of the cartilage, cited above, was an exception to this rule. In all, attempts have been made to force the mouth open, and while these may have been for a time partially successful, their result was only temporary. There seems to be a strong tendency, for what at first must have been a simple, fibrous ankylosis, to turn into a complete or almost complete bony ankylosis. Where the ankylosis was due to changes in the joint that occurred during the growing period there was always a lack of development of the lower jaw with a receding chin. This has been cited by Cryer and a few others and was noted in five of our cases. The cause of this is not clear. If it were due directly to the destruction of one epiphyseal cartilage it would appear that the lack of development in a unilateral ankylosis should be unilateral but this has not been the case. Another possibility that has suggested itself is that abnormal strain of the hyo-mandibular muscles in their strenuous effort to open the mouth may have influenced the shape of the jaw.

SYMPTOMS.

The chief symptom is the inability to freely open the mouth. There may be a limited opening or the mouth may be absolutely closed. In the latter case the mouth is apt to be foul and a solid mass of tartar may cover the buccal surfaces of the upper and lower molars continuously. If there is a somewhat close unilateral fibrous ankylosis, as the mouth opens the chin deviates to the ankylosed side. The reason for this is that while the attempt is made to open the mouth, the condyle on the unaffected side travels forward on the articular eminence; while on the ankylosed side there is only a slight twisting of the ramus on its long axis. This is very distinct, and before the days when the X-Ray was adequate for showing the condition of the joints, we were able by

it to definitely determine which joint was affected. The recéssion of the chin in early ankylosis has already been referred to.

TREATMENT.

The simplest form of treatment and one that has been resorted to in probably all cases, is the forceful distension of the opening. It may be done gradually with a dilator, rubber or pine wedges or with Laminaria tents. The dilatation may be done forcefully under an anesthetic. In one reported case gas was administered an incredible number of times. However, the review of the literature and our own observation lead us to conclude that simple dilation is for one reason or another rarely satisfactory. It can do no good in bony ankylosis and unless it is persisted in for an indefinite period it will be of no permanent advantage in the ordinary close, fibrous ankylosis or when there are dense scars in the cheek. In simple, light joint adhesions dilatation may be all that is needed.

In considering the operative treatment we must distinguish between cases where the joint is affected directly and those in which the limitation is due to scars in the cheek that bind the upper to the lower jaw; though an Esmarch operation is designed to relieve both conditions. For cheek scars which are usually confined to the mucous surface probably the first method attempted was the simple division or excision of the bands, but this is not efficacious for the bands soon unite again or new scar forms at the site from which they were excised.

Esmarch in 1855, before the Congress at Gottingen, proposed his operation which consists of the excision of a wedge shaped piece of bone, three quarters of an inch long, from the body of the jaw in front of the binding scars. This gives a good functional result but is not the best means at our disposal.

In 1862 Clendon, of the Westminster Hospital of London, devised a pair of silver shields that fitted over the molar teeth and had flanges which extended down into the re-established bucco-alveolar cul-de-sac. These were used to protect the teeth while wedges were being inserted and the flanges seem to prevent the scar bands from becoming directly re-attached to the jaw.

Dr. Ewing Mears of Philadelphia divided scar bands by surrounding them with a ligature which was tightened each third day. By this means and with dilation he got an opening of three quarters of an inch.

Brophy has inserted a ring through the tissues surrounding the scar band, as has been recommended for pharyngeal adhesions, later cutting the band at the site of the ring after the ring tract has epithelialized.

It would seem most reasonable to excise the scar bands and replace them with soft epithelial tissue. This has been done with strips of mucosa obtained from within the mouth but these strips may not be easily obtainable. A plan which we have used repeatedly, where the mucous lining of the mouth was deficient and applied with a satisfactory result after the excision of limiting scar bands, is the transplantation of a skin flap from the neck attached by a pedicle and brought into the mouth through an incision in the lower fornix of the cheek. The flap is sutured in place and ten days or two weeks later the pedicle is cut and the defect in the upper part of the neck repaired (detailed description of this method is given in Blair's *Surgery and Diseases of the Mouth*). The skin which must not be hair-bearing adapts itself kindly to the new situation and it seems the most reasonable and satisfactory method of dealing with extensive intra-oral scar bands.

For ankylosis directly affecting the joint that will not yield to simple dilatation, (and in few cases will dilatation be permanently effectual) an excision of the joint or the removal of a section from the body of the ramus will be necessary. (Spanton once divided scar bands around the joint subcutaneously with a tenatome but the ankylosis returned.)

The more rational operation but one more difficult of execution has been credited to Botini and consists in the removal of the condyle, or the condyle and coronoid process when both are involved; often there is but a mass of bone uniting the ramus to the base of the skull.

George Murray Humphrey in 1854 (*Association Medical Journals*, London 1856) excised the condyle for a diseased condition of the process that was distorting the jaw.

Excisions from or sections through any part of the ramus or body have been made but unless a considerable piece of bone is removed or unless some material is interposed between the cut ends, these may re-unite. Various materials have been used for insertion between the bones; metal, gutta-percha, rubber plate, neighboring muscle tissue or foreign animal membrane. We have always used

a flap of the subcutaneous temporal fascia and believe it admirably adapted to the purpose. The method of approach has varied somewhat. For operating near the angle or on the lower part of the ramus the incision is usually made along the lower border of the jaw and the posterior part of the ramus. For approaching the neighborhood of the joint numerous different incisions have been used. The chief essential of the incision is that it renders the joint accessible and that it does not destroy the nerve supply of the orbicularis palpebrarum.

Mears divided the ramus above the last molar from within the mouth and twisted out the upper fragment. The incision which we have employed in all our cases differs somewhat radically from those presented elsewhere and has the advantage that it is almost completely within the hair line and allows of the making of a properly fashioned flap of fat tissue for the construction of the new joint. The skin flap, with a very little subcutaneous tissue, is turned downward and forward. Then a similar flap is made of the subcutaneous tissue down to the temporal fascia; this latter should contain the trunks of the temporal artery and vein uninjured. The parotid gland containing the branches of the seventh nerve and the masseter muscle are stripped downward en masse with an elevator. The site of the joint and the upper part of the ramus are exposed, the condyle, coronoid and upper part of the ramus are removed with burrs, biting forceps and chisel until there is a space of three quarters of an inch between the ramus and the skull. Next, the fat flap still attached at its base is sutured to the now exposed internal pterygoid muscle so that it rests between the cut portions of bone. The skin flap is sutured in place and a rubber dam drain is let out through the lower part of the wound. After cutting the bone the mouth is forced open with a specially constructed dilator. If the mouth will not yield sufficiently then the operation must be repeated on the other side. We have had but one case of double ankylosis, although in one case (a patient thirty-five years of age who had had a complete unilateral ankylosis for fifteen years) the good joint was very stiff and required careful stretching with considerable force. In another case while attempting simple dilatation we fractured the jaw at the site of an unerupted third molar and later after the fracture united we excised the ankylosed joint. Though it causes the patient some discomfort we prefer to dress the mouth open for a week.

This operation which we presented at the St. Louis Medical Society in 1910, we have employed in five cases and the results are such that we have no inclination to modify it in any essential detail, except where there is excessive recession of the chin.

In the latter case the operation, as described above, is done on the ankylosed side and on the other a simple subcutaneous section of the ramus is done with a gigli saw. Then the body of the jaw is drawn forcefully forward and held in this new position by wiring the lower to the upper teeth. These wires remain in place twelve weeks. Later gradual stretching of the new joint is done with rubber wedges or bottle stoppers. In two cases we have rounded out a deficient mental eminence by implanting a section of costal cartilage in the soft tissues of the chin.

RESULTS.

The immediate result where the mouth was dressed open was an opening of three quarters to one inch. By the use of a rubber bottle stopper this opening is preserved or even increased in the next two months; later the opening gradually increases until it may reach one and one-half inches. In a child of five years with a double ankylosis, we were unable to get more than three quarters of an inch opening and a rubber dilator had to be used a long time to maintain this but I believe in time this will increase. In some of the reported cases greater openings have been obtained.

The objects of the operation are to allow the mouth to open sufficient for function, to restore the lateral or grinding motion of the jaw and to allow inspection and cleansing of the mouth. Not the least part of the suffering of these patients is from tooth-ache. An opening of one half inch is not sufficient for any of these purposes but add just a little more and all of them can be carried out fairly well. A gentleman of sixty years of age was sent to me because of an ankylosis that permitted an opening of eighteen thirty-seconds of an inch and which caused him great annoyance. With the help of Dr. J. A. Brown, of this city, we constructed a pneumatic dilator which his dentist used intermittently for about one year and got a permanent opening of three sixteenths of an inch more. With this "he is able to eat bread and butter without getting it all over himself" (quoted from his Dentist's letter). This case is cited simply to show how much a slight gain on the measuring stick may really be in function.

MISHAPS AND COMPLICATIONS.

Aside from simple wound infection the most common post-operative complication is a temporary paralysis of the whole or a part of the seventh nerve. In the incision we describe the branch to the occipito-frontalis muscle will be cut and the patient will be unable to wrinkle the forehead on that side. This has been permanent in our cases. A more general affection of the nerve has frequently resulted from stretching or from wound infection but this usually passes off in five weeks. In one case we injured some fibers of the orbicularis palpebrarum and the patient was unable to completely close the eye for several months but finally fully recovered. One operator divided the trunk of the seventh nerve and had a permanent paralysis. This would seem to be an almost unnecessary accident. In several cases tracheotomy had to be performed during the operation and several operators have done it before attempting the operation. While we have always been prepared to do a tracheotomy we have so far not found it necessary.

In conclusion, it is our belief that, except in comparatively few cases, simple stretching is not a permanent nor an adequate relief for ankylosis of the jaw; but that a properly performed operation will give permanent relief with a minimum of discomfort and with very little risk to life and with great benefit to the patient.

ANALGESIA.*

BY FRANKLIN B. CLEMMER, D. D. S., MORGAN PARK, ILL.

"I come not to bury Caesar, but to praise him." When Shakespeare penned that immortal, satirical speech of Mark Antony over the body of Julius Caesar, the intent of his scathing words was as has here been given. And in coming before this meeting today, while disclaiming all attempts at oratory, I shall do my share to instill into the minds and hearts of any doubtful ones, the praise I feel for this beneficent addition to our earnest endeavors in the elimination of pain, and not to bury it, as some have expected. Before entering into the real essence of this paper, I cannot refrain from expressing my regret at the seeming concerted action of a

*Read before the Northern Illinois Dental Society, October, 1913.

coterie of dentists, who, for some reason, have tried to destroy the increasing popularity of this branch of our work. It has been intimated that a personal animus is behind it all, and not a lack of faith in its efficacy, as would be the natural inference.

One thing more: when I was asked to prepare a paper on the subject of analgesia, it was suggested that my experience in its use be the foundation upon which to build my remarks. So to those here scientifically inclined, my paper, no doubt, will be dull. I shall endeavor to be fair, and truthful, as I see the truth, and hope that something will be said to make some one "hopping mad," and provoke a generous discussion. And, because of the personal experience asked for, I trust you will overlook the enforced use of the pronoun I.

Away back in the dawn of life, when the sun shot its first warm rays over a new world, tradition tells us that the monsters of the land and sea were invested with the means of offense and defense. The reason is obvious. Later on, Biblical literature—I take it a September morn in the year I—presented the tragedy in the apple orchard. And in this we have the reason manifest. And following down the history of man, we learn that Cain, after killing his brother, fled from his accustomed haunts. Why? Into the beasts of the field, the fowls of the air, into man, there came with life, the primitive pain—fear. The animals were given weapons to allay fear, and thereby be removed from possible pain. Adam, in the Garden of Eden, knew that to eat of the fruit meant the pain of expulsion from the Garden. Cain fled because of fear of the Lord. All these fears were primarily pain.

Fear is felt in all walks and endeavors of life. There is the fear of the elements, of land loss, money loss, death, surgical operations, and dental ones. And when a dentist is asked to read a paper on analgesia, before an assembly of his peers, the same condition exists. And does any one deny that these fears are not in themselves pain? It has been said that pain is a providence. Grant it! Yet few really care for providences along these lines. Pain, then, is an inherent quality of life. The cooing babe, approached by some object foreign to its primitive mind, will give evidence of the fear of pain. The startled animal also gives forth its sense of the nearness of pain. So it is a non-argumentative fact that pain is a concomitant of life.

Pain in our own work—and I am gradually coming to that point—is the *bete-noir* of our profession. How few come to our chairs with songs on their lips and joy in their hearts. Like the proverbial schoolboy, they lag behind, waiting for the last bell to ring, and cursing the fate—and as well the dentist—that drags them on.

Let us, for a moment, cast a glance backward, and note the progress toward the promised land of painless dentistry, and the methods employed.

In the 16th Century the dentist was used largely as a remover of aching teeth. His instruments were of the crudest type, and few in number, and pictures of the times depict the victim doing a “merry horn-pipe” to the dentist’s gentle (?) persuasion.

Later on came the hand drill, and the numerous other instruments, to excite the wonder, and horror of the prospective patient. And while I lay my offering at the feet of the noble men who struggled onward toward the light, I cannot lose sight of the fact, that dental pain marched in the van.

But evolution is “evoluting,” and when the speaker came upon the dental scene of action, he was greeted with rows and rows of Victrola-like stands. This surely was the pinnacle of dental progress. Many dentists installed this cataphoric outfit, claiming perfect results in the elimination of pain. And was it all hypothesis? Not by any means. It was a splendid step upwards. The defects became apparent months afterwards, in a great many cases so much so, that it is now practically abandoned. But its short life was not in vain, for it stimulated the enthusiast to persevere. And even before this, there were some who were so fearless as to use chloroform vapor to remove the pain of dental operations. Bear in mind the pivotal point of this paper is pain elimination.

There has always been more or less endeavor, and I dare say with marked success in some cases, to use medicinal applications in dental cavities for relief from the drill; but in most instances the application is so prolonged and painful that its use is limited.

The human temperament has so many tangents, that it is impossible to apply the same healing agents for practically the same conditions, in different cases. One person will express in unequivocal terms, that a certain procedure is unendurable, while others will state precisely the opposite.

There is not a dentist before me who has not been burdened to the point of despair, times without number, by such conditions, standing "between the devil and the deep sea," as it were, until willing to jump into the sea, even if to do so would be to meet the "old fellow" on the way down. The dentist knows where the pain can be expected, when opening a tooth, and the patient knows weeks before he enters the dental reception room. So-called funny stories have been the panacea from the dentist's standpoint—abridging the horrors of the work—but few who have been at the working end of the drill, have been able to "catch the point" at the precise time the dentist planned, and another "butcher" has had his name placed high on the list of those who, by all rights, should be taken out and burned at the stake.

There is no getting around it, the rank and file judge us, not by the expertness of our work, but by the pain inflicted. If we hurt but little, word goes out that Dr. So and So is a fine dentist. If otherwise, no matter how technically fine the work has been done, he is heralded in all directions as rough, careless of your feelings, horse doctor, etc., etc., ad nauseam.

Let me ask how many who consult us for work, know what constitutes good dentistry? You have all had it answered in your own offices. For instance, a party comes to you and points with pride to a tooth, filled five or ten years ago, and the filling is still in place. You know at a glance that that tooth has merely been filled, but the contact point, or mastication surface never were restored. Or a crown, whose general outline is as near like that of its natural fellows, as a horse-shoe resembles a bag of oats. And yet such is the opinion of a goodly number. And now comes the final analysis "and I hardly knew he was fixing it." Memory is so fleeting.

And now, in our grand forward movement,—and dentistry is moving with prodigious strides—comes a new factor—new and yet old—to give to those afflicted the relief long sought, a means whereby the drill has lost its terrors, and the dentist can feel that he is a man without a peer in assuaging one of the most distracting pains of suffering mortals.

Nitrous Oxid and Oxygen enters the field at a time when the ravages of tooth decay are greater than in any former period.

N₂ O & O is practically safe. The percentage of mortality

in dental operations is so low as to be negligible. It is true that anything that places the body in an abnormal condition, subjects that body to changes that can prove hazardous. A great railroad corporation would not place a brakeman in the engineer's place, and expect safety to passengers. Neither should we use an anesthetic, of any description, without thorough information. No care is too great when a life is at stake. And while $N_2 O \& O$ is the safest anesthetic before us, it behooves every one using it to employ diligence and discrimination, coupled with a strong confidence in his ability to meet every phase that might present.

It benefits both patient and operator. One condition is paramount: the confidence of the patient must be assured. Without that co-operation, failure is just around the corner; and when once you possess that confidence, you can work along with ease to both parties concerned.

The stage of analgesia, the one in which I do nearly all of my painful cavity preparation and denuding of teeth, is mild and quiet. There are people whom you cannot control under analgesia, because of preconceived ideas of dental pain, or memories which will not down. To such, anesthesia is the last resort, and the one I am very slow in adopting; for I prefer to work when the patient can do my bidding. I have had them, however, fall into a light sleep, and not be conscious of any drilling whatsoever, only to awaken later to learn that the ordeal they dreaded was over, and the customary pain not experienced.

And what must a person feel, who, heretofore endured the "tortures of the damned" while under our "light, expert touch" with drill and crowbar, and now sits in our chair and experiences so little inconvenience? Gratitude! Profound gratitude, the kind that makes you, Mr. Dentist, smile inwardly and outwardly. Not the "I am it" kind; but to the one who is deeply interested in doing for his people everything in his power for their betterment, disregarding the selfish end, it will raise him up to the seventh pinnacle of enthusiasm for his chosen work.

We all know of the attendant worry of a full day, or days, in which there is a pulling of the arm, a series of remonstrances, tears and pleadings, with the result that some work is but poorly done. When your patient is under analgesia these conditions are nearly all absent; so much so, that your work is made comparatively easy.

And the evening finds you with a song in your heart, and you go to the bosom of your family with an unclouded brow.

Does analgesia remove all pain? Some enthusiasts claim that it does. I state here, without fear, that it does not, in all cases. For again individual temperaments play their part. In one family I worked on three of the members, two of which gave very little, if any, evidence of pain. The third was nearly uncontrollable, and yet, when I suggested that the next sitting be without the anesthetic, she at once objected.

Children are not good subjects for analgesia, at least that is my belief. There may be some who can gain their confidence, but I have not tried any child younger than eleven years. This boy, referred to, shed copious tears when pit cavities in the molars were drilled. I decided to try analgesia the next time he came. And this is the way I proceeded.—“Lloyd, how would you like to have the next two teeth cleaned out without hurting you?” Of course it was only natural for him to say that he would like it, as I expected. Then I told him, in a simple way, of $N_2 O$ & O , that I had taken it, and thought it fine. He consented finally, and we proceeded. I encouraged him all the way through, and his tears turned to smiles, and he left the office happy.

I spoke heretofore of the dentist's confidence in the agent he employs. Sometime ago, a young lady who assists a dentist on the North Side of Chicago, visited my office, to see how other men do their work. We talked of different adjuncts of dental practice, and I asked her if Dr. X used analgesia. She replied that he did not; that he had had it used on him but did not like it; that he ordered an outfit, however, but could not induce his patients to accept it, so sent it back. Gentlemen! Could you, would you expect success in any line of work with such a poor equipment of enthusiasm? The mediocrity of life lies in a half-baked enthusiasm, or in a poor quality of confidence. And in the employment of analgesia, nothing helps so much as a well defined expression of confidence that you can pass on to your patient. Bear in mind, I am speaking in a general way. There will come to your office people, who, in spite of all your painstaking, and dignified explanation, refuse to accept your point of view. Then you will do as I do: work without analgesia.

In discussions that I have heard on this subject, the dangers

were pointed out with startling boldness: arterio-sclerosis, over-dose, needless pulp exposure, the hurry of the work through fear the patient will die while in the chair, poor cavity preparation, etc. I said a few moments ago, the one using analgesia, or anything that places the body in sub or abnormal condition, must have a clear understanding of his limitations. Arterio-sclerosis is one of the troubles of later middle life, and old age, and should be considered, not only in analgesia, but in all our work in which undue shock or excitement might prove disastrous. In analgesia there is no chance of an over-dose, for oxygen is the factor that holds back the dangers of nitrous oxid. I am often asked, "Is it safe?" And to some I have replied, "An ordinary hammer is for the purpose of driving nails, but it could be used as a murderous weapon, thereby defeating the original purpose. You know of numerous fatalities in elevators, and conveyances of all kinds. Why not abstain from using such things and walk? But in walking you may meet other dangers, so how much better off are you than before?" Such common-place illustrations calm the ones prone to fear, and the way becomes easy to gain the consent to use it.

And right here is the time to carefully, and easily explain the workings of the anesthetic. A mere bombastic exposition will defeat your purpose.

The public at large is used to the idea of anesthetics in general surgical operations; and having still the hallowed fear for this class of curative procedure, they make no special resistance to its use. But in our work, the idea is not well enough established, so profuse explanation is necessary.

There is great alarm felt in the minds of the opponents of $N_2 O$ & O as to the needless destruction of pulps. Why should pulps be exposed to a pitiless world in using analgesia, any more than in the ordinary methods? The dentist who has command of his work, can be as careful, knows the anatomy of the tooth as well, as he who uses but the drill. The idea of hurry is unwarranted and having ordinary eye-sight, he will cut the cavity courageously, intelligently, and expeditiously.

The trouble with most men fighting analgesia is that they do not know their premise by personal experience. When I took

up this work, I started on myself. A large compound cavity in a molar needed attention, and I knew by previous experience that exquisite joy (?) awaiting me by the regular method. If this new method was any good, I was going to learn of it; and knowing, I would then be in a position to speak with conviction to others. I was under the influence twenty minutes or more, the old amalgam filling was removed, extension was carried out to the limit, decay removed from the bottom of the cavity, and pain as scarce at \$1,000 fees in my practice. Now to be absolutely accurate, I did feel some pain four or five times; but conceive how many times four would have been my lot, had $N_2 O$ & O not been given. Can you imagine my enthusiasm, and can any one having that experience fail to impart a similar confidence to one in his own office? Had I merely gotten an outfit, and learned its technique, it would be safe to infer that my endeavors to influence others to partake of its blessings, would have been haphazard and lacking in force, and the results would have been of the same caliber.

Now as to faulty cavity preparation. I say it modestly, that this part of my work has been as technically correct while using $N_2 O$ & O as the work of others I have seen who use it not. And why should it not be well done? The patient is quiet, does not fret, is without pain, and disturbing factors are absent. My assistant attends to the $N_2 O$ & O , and watches the patient, and I go ahead with my work, confident that I am doing all in my power to make my work of lasting worth, and doing it without offense to the person's nerves.

Here is another objection raised to its use: this dentist said that the advertising offices were using $N_2 O$ & O . They also make whalebone (?) plates, gold inlays, and everything we do. Shall we rescind our rights because someone, to whom we give no professional cognizance, uses the same progressive methods we do? They are dentists, the same as we, only a little off color ethically, and who dare deny them? They are business dentists, who place the financial part at the highest point, and ignore that which we esteem pre-eminent,—honest service.

Two dentists to whom I spoke regarding analgesia, told me in confidence that their personal fear of anesthetics was what kept them from using it. As one tersely said, "I am so damned afraid of all anesthetics that I cannot use it." Fear will never produce

any thing but failure, and he who allows it have the preponderance will reap but a harvest of regrets in any line of endeavor.

And how shall we introduce this new method to our clientele? Shall we do as I heard a man state in a society meeting, "There it is, you can have it if you want it," and the first remark has raised an objection in the patient's mind. As opprobrious as it may seem to some, I must use the phrase "service selling." I get angry "all over in spots" when I hear it said that dentists are poor business men. And if they are so, it is because they are not training their minds as much as their hands. We must convince people who seek our services, because they know practically nothing of what our work really is, or means to them. The placing of honest statements before them, in a business-like manner, gives them confidence that we can and will perform what we say. And having that confidence insures a respect for, and a willingness to follow out our ideas. So in gaining their willingness to take $N_2 O \& O$, a presentation of the salient features of the procedure, set forth in a business-like manner, showing that we are masters of our new servant, will go a long way in having them accept the boon we offer.

There are people who come to my office and say, "I just dread this." And right then is the time to start the service talk. I tell them I have an apparatus which will remove that dread, and can do their drilling with practically no pain. They are at once interested, and then I explain the method. The eternal question, "Does it affect the heart?" is never missed, and I immediately seek to quiet that fear. "Is it 'laughing gas?'" for if it is I cannot take it," and I sometimes say there is no such thing as "laughing gas" any more than there is "laughing chloroform." To tell them it is $N_2 O \& O$, with the emphasis on the "O" has the desired effect, for every one seems to know that "O" is a life preserver. And so when doubts are removed, consent is given, and I proceed with the administration. It is but a few moments before the effect is noticed, I give a few encouraging words, and when analgesia is reached I reassure them by saying, "That is all there is to it." You will not get a bit more than what you have. It is not a bit bad, is it?" And they, having full consciousness, seeing me and hearing my voice, "become as clay to the potter's hands." As one

woman said while under the influence, "Your talking to me as you work reassures me." Another woman remarked, after having four or five cavities drilled, and at the same sitting filled, "This is the first time I ever left a dentist's office without a headache and all tired out." I suggested to a young man that he take the $N_2 O$ & O , and he said, "I have a nervous heart," to which I replied, "Forget your heart," and he did. Two compound cavities were prepared, and absolutely without pain.

Recently I denuded a bi-cuspid for a physician, a man much larger than I, but a mortal coward in the dental chair—his own admission. The work proceeded splendidly,—no pain, but a tendency towards sleep. He suggested removing the inhaler, which I did, and worked until the effects partially wore off. It was not long until pain was felt to a marked degree, and he willingly took more of the gases. Inside of four inhalations, I placed the stone on the same part of the tooth, where before it had been unbearable, and I reduced that tooth without a bit of pain. And this is what he said,—“That certainly is great stuff. No more dental work for me without it.” I could go on indefinitely giving similar cases, but it would be merely repetition.

I have had some people give me trouble. The overmastering dread that would not be quieted, was greater than my suggestive force; but the percentage of success is far greater than that of failure. But even these, unruly as they were, objected when I stated that I would not use it at the next sitting. And should I be a “quitter” because a few could not be counted as successes? No more than that I should give up the use of gold because I made a number of poor fillings.

I have not said anything about fees for this work. I approach this part with caution, for in dental meetings, even if not in private practice, the laborer is not worthy of his hire. And yet I get a fee in excess of the regular one. And how do I get it? By asking. The Bible says, “Ask and it shall be given you.” Of course, the Bible does not have reference to analgesia, but I apply this in my work along this line. When cocain was first used, I read that a fee of \$5.00 was demanded and paid. It was a new departure; people learned that pain could be eradicated in many instances, and were willing to pay for the relief.

I exact a fee in all cases, and will not use the anesthetic under any other conditions, unless in cases of charity. But my fees are not commensurate with the relief afforded, nor am I endeavoring to make a large profit on the investment. Enough to pay for the installation of the apparatus, the employing of an assistant, which of course this method demands, and the recharging of my tanks, coupled with a small fee for my labor, is all of the monetary value I exact. Here is where I realize: the patient is pleased with the results, the news is spread, and I have an increase of patronage that would not have been mine with the old methods. And is that all? No. I have merely spoken of the selfish side. There is another; and to the dentist who is at heart, broad in his conception of his duty, it is this: a means whereby he can, does do something for the sufferer that money cannot reward; a satisfaction in knowing that he has helped some one over a rough road to a better feeling for his fellowman, because pain has been made to bow in obeisance to scientific research.

We, as dentists, have a duty beyond the dream of wealth, pleasant though that dream may be. To some of us, I fear, wealth will always be a chimera. But we can so perform our duty that conscience will reward us, and we, wrapping the "draperies of our couch about us, lie down to pleasant dreams."

And in analgesia or anesthesia have we reached the perfected method of painless dentistry? I hope not. I want to live to see the time when a method will be advanced that will produce the ideal dental condition, without placing the patient in an unnatural state. We cannot say it will not come.

The almost unbelievable achievements of the telephone, wireless telegraph, air crafts, electricity, were the unthought of things but a few years ago. And yet they are here, and we take them as a matter of course.

And when the last word has been spoken, and painless dentistry, enveloped in all its glorious attributes, is the everyday practice of every dentist, when primitive pain has been forever cast aside in our work, I want to meet you and though with bent form and palsied hand, live over again the youth of our profession, when analgesia gave to a waiting world the first true evidence of the dental millenium.

DENTAL RADIOGRAPHY.*

BY F. F. MOLT, D. D. S., CHICAGO, ILL.

No scientific discovery of recent years has excited such immediate or lasting interest as that of Roentgen in 1895, and strange to say very little knowledge has been added to that given to the world by him at that time. Changes and improvements have been made to be sure but the underlying principles were so clearly and thoroughly stated that practically nothing new has been added since his announcement.

Roentgen's experiments followed investigations by Sir William Crookes to whom credit is due for the pioneer work with electric discharges in exhausted tubes, but it was Roentgen who discovered the property of penetration possessed by the rays which he called X-rays and their property of acting on a photographic plate. The degree of penetration is in proportion to the specific gravity of the substances, and this brings us to its use in surgery and of course in dentistry. A radiogram is a register of densities, and the usefulness of the picture to the operator depends on the ability to "read it"—to differentiate in the matter of tissues as penetrated by the rays.

It is doubtful if any one thing has been of so great use in surgery in eliminating empiricism and quackery as the X-ray. Many of the mysteries of medicine have fallen before its searching eye and new uses for it are constantly being found. When one thinks of the general use to which it is put in hospitals, and like institutions and the size of the industry conducted in its use, one realizes to what a degree surgeons have come to depend upon its aid.

Unfortunately, as in all such scientific discoveries, some harm was done by its unskilled use and alas, many of the pioneers in radiographic work not being cognizant of its cumulative and irritant effect, were victims of their own zeal in experimentation, and its early years are marked by the horrible deaths of those who recklessly and thoughtlessly exposed themselves to its deleterious influences.

*Read before the Northern Illinois Dental Society, October, 1913.

Conservative operators, however, soon found ways to protect both themselves and their patients and in the light of present knowledge of the physical properties of the rays there is no excuse for harmful effects.

The application of the X-ray to dentistry has been increasing gradually as operators have realized that its use marks the transition from "guess work" to practical certainty, and while it is not infallible as a sole means of diagnosis it often supplies just the requisite knowledge.

I am going to show you some slides that give a very decided insight into its value. Many times a case will present a new patient possibly, where several attempts have previously been made to locate the source of a discharging sinus. Many times you are confronted with three or four teeth, any one of which with crowns, large inlays or fillings, may be in condition to cause trouble. To proceed by elimination to locate the trouble will often times be a needless expense to the patient, and not infrequently the wrong tooth will be sacrificed. Not to take advantage of every method of determining which is the diseased tooth really borders on malpractice.

A case came to us just a few days ago where the first bicuspid had been lost and the dentist had curetted the socket thoroughly. The flow of pus still continuing, it was suspected that the cuspid was abscessed and had involved the antrum. Second bicuspid and first molar both carried crowns. The patient presented for a radiogram and the second bicuspid was shown to be the offender although quite firm. In this case it was hard to convince the dentist that it was not the cuspid that was abscessed.

In chronic abscessed conditions the extent of destruction can be determined; the advisability of saving the tooth or extracting it, or the possibility of root resection and the extent of resection necessary shown. Often it will be possible to save one root of a molar when the rest of the tooth is hopelessly abscessed.

In antrum diagnosis a film picture of one antrum is not entirely dependable. There should be a head picture showing both antra, in order that their density may be composed.

In the matter of locating impacted third molars and other im-

pacted teeth it is of supreme value. In many cases there is absolutely no sign of the impacted tooth; nothing to indicate its position or even its existence.

Only yesterday we located and removed an impacted lower third molar that was causing an intense neuralgia. No part of the tooth was visible and the dentist was entirely at sea as to the cause of the trouble. The patient in this case was only twenty and had consulted a prominent nerve specialist whose diagnosis was "neuritis," or "tri-facial neuralgia," but who could not designate the cause.

Even if the crown of an impacted molar is visible the X-ray gives invaluable aid in the extraction by giving the extent of impaction and shape and position of the roots, and the thickness of the process surrounding the tooth. Then one can proceed intelligently to operate.

Another valuable aid is that of determining the advisability of extraction of deciduous teeth, to make sure that the permanent tooth is ready to succeed the deciduous, or know surely that there is a succeeding tooth, and in orthodontic procedure to watch the progress of the work. Dr. Barnes of Cleveland, who widens the upper arch by opening the median suture, makes frequent X-ray exposures to note the widening of the opening.

One might almost say, "In case of doubt take a Skiagram," for there are an infinite number of other cases where this aid is valuable; for instance.

To determine the size and shape of canals to be filled and after removing the contents of the canal to make sure that they are ready for filling. This can be done by inserting small wires to the apices and taking a picture. Then after the roots are filled, the root filling can be observed. The presence or absence of root filling may also be determined.

To distinguish between a supernumerary tooth and that to be retained. To determine in pyorrhea conditions, the extent of tissue destruction and the location of proximal deposits.

It would often protect a dentist against malpractice suits to have a definite record of work thoroughly done. It is also worth while in cases of neurotic patients where imagination runs riot, and they are willing to take their oath that you have left a por-

tion of tooth in place or done any of the dozen other things that you know you have not. Here is an incontrovertible proof.

Finally, it becomes a saving help when all other methods of diagnosis fail. Where you suspect impactions, cysts or like involvements, make a picture. To me one of our most interesting cases has been this one of which I show the slide.

The patient, aged 28, came to us with a chronic discharge in the lower left first molar region. He stated that he had sixteen years before had an abscess of the molar and had had it removed. About a year before he presented to us he had had the space bridged, using the second bicuspid and second molar. About three weeks before a swelling had developed under the bridge, with attendant pain, and he had this opened and the bridge removed. The swelling subsided but the discharge continued. Both abutments of the bridge were vital and X-ray showed no remaining portion of the molar.

A plate was made of the entire jaw which showed a small, peculiarly shaped object apparently imbedded in the mandible, on the left side. The teeth were all in place on this side, but the right lower cuspid was missing and the patient did not know whether or not he had ever had it extracted.

Two or three exposures were made from different angles, all showing this object which, although it didn't look at all like a tooth, we finally determined must be the missing cuspid. The patient was accordingly operated upon and the right cuspid found lying beneath the left cuspid and first bicuspid. A sinus extending to the molar region was curetted and the case made an uneventful recovery.

So we see how valuable this adjunct may be to us. Perhaps the time will come when this will be considered a requisite part of our office equipment. At any rate you are justified in insisting when you feel it necessary that radiographic diagnosis be made both for your patient's good and your own protection.

PREVENTIVE THERAPEUTICS.*

BY M. H. CAZIER, M. D., CHICAGO.

The present day movement toward advancement of the human race is charging to the account of medicine and surgery a great duty. Whether as individuals we authorize it or not is immaterial—we are charged with the duty to prevent disease.

Posterity will write whatever credit we merit. Every member of the profession practicing its arts should be alert, aggressive and seek to aid in this the greatest achievement of modern times. No man has ever earned a clear title to self respect until he has prepared himself as best he may and has rendered to humanity the best service that is in him.

Self preservation, the first law of nature, too often controls our conduct and keeps us groveling in the fog-covered valley, with our eyes focussed on pelf and the dust, and we are "wont to fill our bellies with husks," when a glance upward discloses to us the path of duty which leads to the mountain top amid the glory of sunshine, the beauties of manhood and the consciousness of leading a just and upright life.

Upon the very threshold of our undertaking we are confronted with difficulties, not discouraging—but challenging our energy and our faith. Confidence and co-operation on the part of society at large is lacking. We find the entire profession is discounted because of the crimes of a small portion of its votaries, this to the great detriment of society. Our first duty therefore is to draw a line of demarkation between honor and dishonor in our own ranks. There are those masquerading as professional men who do not hesitate to pander to disease in order to exploit its victims, and the entire profession suffers in public esteem because society does not stop to reflect but enters judgment "by default." Let us therefore now create a legion of honor in the profession, membership in which to require that the candidate shall sincerely seek to aid in the discharge of this stupendous duty with which the profession stands charged, and thus gain public confidence by being worthy of it and invite the co-operation of mankind to aid

*Read before the Odontological Society of Chicago, October 6, 1913.

its own advancement, and at the same time separate honor from brigandage and make the path attractive which leads to the goal, preaching the gospel of cleanliness and sanitation as a means to prevent disease.

Typhoid fever is a disgrace and reflects upon the intelligence of a community in which it spreads. Losses occasioned by it are an absolutely unnecessary waste. The same is true of many other forms of illness and society only needs to advance and exert its powers to free itself from the great financial loss, not to mention the sorrow and disappointment which result from early and untimely death.

To come to the present hour and its duties, let it be remembered that in a recent survey of the children of the public schools of the city of New York, out of 230,243, 135,843 have defective teeth—defects grave enough to be detected by the cursory examination of the medical inspector. Caries is common and is found in 50 per cent of children in the lower grades. School officers show the enormous loss arising from the accompanying pain and discomfort which reduces the efficiency of the child. You of the section of dentistry will note the damage to the teeth, both to the present function and proper nutrition of the permanent set. As physicians and humanitarians we count all this and the consequent physiological poverty which renders the child susceptible to the multitudinous forms of disease and death. And particularly the definite danger which exists wherever caries opens into the pulp chamber, through which the blood stream is invaded by the germs of the fatal diseases of childhood. If the proportion in New York is true elsewhere there are over nine million children in the United States with decayed teeth. It is small wonder that the annual deaths from spinal meningitis and allied maladies are counted in the hundreds of thousands. To reduce this awful slaughter is one of the pressing duties of the hour. Let parents be educated that children's teeth when they first appear must be the object of care and that adequate cleansing at night is absolutely essential to the welfare of the child.

Sanitation of the mouth is one of the most important needs if we would prevent or minimize disease, and with this cursory review your attention is now called to a recent contribution I have made to our means of cleansing the mouth and at the same time

performing massage of the gums and inducing a condition of hyperemia of the parts—all of which I trust may contribute to human welfare and assist you in your ministrations to mankind. The instrument I have named the "Sanitor" is on the sideboard for your inspection and criticism. (The method of application was then briefly stated by the author.)

THE INDICATIONS AND CONTRA-INDICATIONS FOR PULP CAPPING, AND DEVITALIZATION.*

BY C. N. JOHNSON, M. A., L. D. S., D. D. S., CHICAGO, ILL.

With the conscientious operator it is often a nice point to decide between pulp capping and pulp devitalization, and it may be said at the beginning that no hard and fast rule can be given as invariable. But your essayist believes that much good may come from a careful study of the factors involved in pulp destruction to the end that a more conservative method of practice is inaugurated than has been advocated by some practitioners. There seems to have developed in the profession a conspicuous indifference to the value of the pulp in the life history of a tooth, and the statement has repeatedly been made that the full development or calcification of the tooth saw the function of the pulp fulfilled, and inferentially that there was no object in saving it alive after that.

There are two considerations in this connection which should be taken into account, one the possible impairment of the supporting structures of the teeth following pulp destruction and the other the fact that in most teeth with all the varying locations and directions of pulp canals no man can say that he is always able to successfully fill them perfectly to the end.

The offhand remark so frequently made in defense of pulp devitalization that "Dead pulps tell no tales" is not true in fact any more than it is manly in sentiment. Dead pulps sometimes do tell tales of the most sorrowful kind, and even if this were not the case there can be no excuse for any practitioner to hide behind a subterfuge and shirk a responsibility merely because in facing the issues which present themselves in the best service to the patient he is sometimes confronted by a failure.

*Read before the Chicago Dental Society November 18, 1913.

It is folly to attempt to save pulps under certain conditions, some of which are as follows: If a pulp has become completely exposed and the horn of the pulp sufficiently infected to begin breaking down there is no probability of this pulp ever recovering—particularly in the tooth of an adult. In cases of calcific degeneracy of the pulp whereby the pulp is rapidly undergoing a hardening process with spiculæ of calcic material running through it the destruction of the pulp is clearly indicated. In nodular growths in the pulp which cause neuralgia the pulp should be destroyed, or in cases of continued irritation to the pulp in the apical region through advancing pyorrhea pockets, leaving the tooth constantly hypersensitive to thermal changes. In bridge-work the abutment teeth should, by virtue of the necessary preparation for crowns, quite generally lose their pulps.

But to slay pulps in the wholesale manner that is practiced by some operators is not in accord with the best service to the patient. The loss of a pulp should not be looked upon with the indifference that some men view it, because aside from the main function of the pulp in building up the tooth tissue there seems to be some connection between the vitality of the pulp and the integrity of the supporting structures of the teeth. As an evidence of this a tooth may be tested in the following manner: A record is made of the greatest force which may be sustained by the tooth on closure of the jaws when the pulp is alive. Let the pulp be destroyed and the canals filled under the most careful precautions and then test for closure. It will be found that the tooth will not tolerate a pressure nearly so great as it did while the pulp was living, the difference running as high in some cases as sixty pounds. Dr. G. V. Black estimates that the masticating capacity of a tooth is impaired fully one-third as the result of pulp destruction. Any process which will make so profound an impression on the pericemental tissues as this must receive due consideration. It is not that a tooth is necessarily made uncomfortable for mastication, or that it must be condemned when the pulp is destroyed. Many of them perform a most useful service for years and answer well for mastication, but no man is in a position to estimate the exact time a tooth will last after destruction of the pulp, or to say that the average length of service of a tooth is as great when the pulp has been destroyed as it would have been with the pulp alive.

The possible effect of pulp destruction on the teeth is being more vividly brought to notice in recent years as the result of a demonstrable connection between pus conditions in the mouth and some of the common general disturbances in the system. No one will deny the depressing effect of chronic alveolar abscesses, or the constant flow of pus from pyorrhea pockets. It is true that all pus in the mouth does not come from pulpless teeth, and it is also true that many pulpless teeth remain healthy after being properly filled; but the fact remains that there are very many teeth with pulp canals of such a form that no man of human skill can thoroughly fill them to the end, and that when they are not filled there is constantly the danger of abscess. Dr. T. L. Gilmer has estimated that one in every four persons having pulpless teeth in the mouth probably has a chronic abscess somewhere in the jaws, and that the abscess of which neither patient nor practitioner is aware may be doing more harm than the one which is made apparent by a sinus. To needlessly destroy the pulps of teeth with roots of a character that it is impossible for the operator to predict what the canals are like, is akin to closing one's eyes and firing at random in the air. It may gratify a passing whim and produce a mild thrill, but it is not good judgment, and may do much harm.

Pulp capping has quite generally been tabooed of late years by the profession, and yet in certain well defined cases it is the best possible practice. Pulp capping is indicated in the following cases: Where the tooth has given little history of pain and where the pulp has been only slightly exposed by instrumentation without being infected or subjected to infection by being bathed in the fluids of the mouth; in cases of young patients where we are not certain that the apical ends of the roots are completely formed; and in those cases of adults where there is any promise of saving the pulp in teeth the cavities of which are so located that it is difficult to reach the canals and properly treat and fill them without grinding or drilling away most of the crown. We may not always succeed in saving the pulp by capping, but we should at least try in the cases indicated, and we should have a frank understanding with the patient as to the possibility that we may fail.

The need is very urgent to save pulps till the teeth are completely formed, and while there is some variation in the period

at which calcification is finished yet the average is about as follows: For the incisors and first permanent molars ten years of age, for the cuspids and bicuspid eleven years, and for second and third molars it is at least a year or two later. Although the precise behavior of the tissues surrounding the apex of a root which has lost its pulp before calcification is complete is not definitely known it must be acknowledged by every one that it is desirable to keep the pulp alive till the apex is formed, and in this connection it may be stated that the chances of saving an exposed pulp are greater before the apical foramen becomes constricted than afterward. With the narrow foramen of adult life irritation in the pulp is likely to lead to strangulation at this point. In other words, the pulp will tolerate more irritation from exposure without dying in the tooth of a young person than in an adult, and this is fortunate because of the greater necessity of saving the pulp in youth.

To summarize this phase of the subject we should save pulps alive whenever we can do so in young patients, and in the case of adults we should consider carefully the conditions presented to us as they relate to the length of time and extent of exposure, presence or absence of inflammation, and position and character of the cavity in the tooth. I leave for the last a most sweeping condemnation of the practice which seems to have gained considerable headway among certain practitioners—that of destroying pulps on the sole ground that a cavity is sensitive and cannot be prepared for filling without causing discomfort. I do not believe in giving more pain to patients than is necessary, and I recognize the fact that some cavities are too sensitive to be properly prepared for permanent operations without pain. But I do not believe there is any cavity that cannot be controlled with a little medication in the form of such obtundents as have frequently been recommended for this purpose sufficiently to be prepared for an oxyphosphate filling, and if we can protect the cavity from external irritants with oxyphosphate for a few months we will have little difficulty in making a suitable preparation for a more permanent operation. The trouble is with most operators that they allow the cement to remain in the tooth so long that it is worn away sufficiently to expose the cavity and renew the sensitiveness. A little conservative practice of this kind will result in much better service to the patient than will the wholesale destruction of pulps as a mere mat-

ter of expediency, leading as it may in future years to the possibility of lame and abscessed teeth.

METHODS OF PULP CAPPING.

Your program committee has requested me to consider methods of capping and devitalizing pulps, but this must be done very briefly. Let me remark in the beginning that in any attempt to save a pulp which is exposed or nearly exposed the instrumentation is a very important factor in the operation. When from the nature of the cavity there is suspicion in the mind of the operator that there is likelihood of the pulp being exposed in excavating the greatest care and delicacy must be employed not to needlessly expose the pulp. The cavity should be well opened up by chisels and then sharp thin-bladed spoon excavators should be employed to gently lift away the softened dentin, avoiding the immediate vicinity of the pulp till the major portion of the softened mass is removed. The cavity should then be flooded with a non-irritating antiseptic (Buckley's phenol compound being an excellent one), the surplus absorbed with cotton, and the most delicate manipulation employed in removing the softened dentin from the vicinity of the pulp. It must always be a nice point of distinction to determine just how much tooth tissue may be removed without actually exposing the pulp. An exposure should be avoided if possible and yet it is not safe practice to leave any appreciable mass of softened dentin in the vicinity of the pulp. In case the pulp is accidentally exposed and it is felt that there is any possibility of it being infected, an antiseptic should be used in the cavity at once and the tooth kept free from the ingress of saliva till the cavity is sealed.

The material used for capping the pulp will vary with different operators, but it must have certain properties such for instance as that of being a non-irritant, a non-conductor and capable of adaptation without appreciable pressure. Your essayist has found that a paste made by mixing the powder which comes with our cements, and composed mostly of zinc oxid, with oil of cloves has been very satisfactory. Dr. Buckley has suggested precipitated calcium phosphate instead of zinc oxid on the ground that the latter may contain traces of arsenic, but a somewhat extended clinical experience with this material has failed to develop any deleterious effects from this source. After the paste has been very gently patted to place over the pulp the cavity is filled with

oxyphosphate of zinc, and this is left in the tooth as a test for six months or even longer before filling the tooth permanently.

Occasionally a pulp will die under a capping even with the best management, but usually if treated in the manner indicated it will be found that little pain accompanies its death. An undue sensitiveness to thermal changes develops and a soreness on mastication which sends the patient to the dentist for relief. The symptoms are such that the operator can tell at a glance what the trouble is and by removing the filling can bring immediate relief.

METHODS OF DESTROYING PULPS.

When it is determined that a pulp must be destroyed there are two general methods of procedure which may be followed—one by means of pressure anesthesia with cocain, and the other by devitalizing the pulp with arsenic trioxid. The technique of these procedures has so frequently been described that it is unnecessary to do so before this society, but a few words may be profitable as to selection of method. With some operators the pressure method seems to appeal with stronger force, and they employ it almost exclusively, but there are certain limitations to this method which should be recognized. There is one essential to success which under certain conditions is extremely difficult of attainment—the medicament must be retained in the cavity and forced directly into the pulp tissue. This with cavities of certain form is impossible, short of some previous preparation in the way of gutta percha or cement walls to prevent the escape of the cocain, all of which requires time. Then again there are cases where the method results in considerable pain to the patient, and in subsequent soreness in the tooth. It is seldom safe to fill a canal from which the pulp is removed in this way at the same sitting, and this necessitates sealing a medicament in the tooth for a few days before filling. All of this is accomplished at an expenditure of time, and while the claim is sometimes made that the pressure method is more expeditious than the arsenic method this statement is not always borne out by fact. In teeth with more than one root this method is seldom satisfactory on account of the difficulty of forcing the cocain into each canal. In some single rooted teeth the plan works to perfection and when it does work well it is an ideal method of practice.

The application of arsenic trioxid in the various modified

forms in which it is prepared need give very little pain in the majority of cases, and as a matter of fact the aggregate time spent at the chair is usually less than with pressure anesthesia. One special precaution seems necessary. No application of arsenic should ever be made to a cavity which leads to the gum tissue without first protecting the gum from any possibility of injury from the arsenic. This can be done by first building a barrier of gutta percha across the gingival wall of the cavity between the gum and the exposed pulp before making the arsenical application. Unless this is done the danger is grave of forcing the arsenic past the point of exposure and bringing it in contact with the gum in introducing the sealing agent into the cavity. If arsenic trioxid is used in small quantities carefully applied without causing pressure on the pulp, and then securely sealed against leakage it will be found a very effective and safe means of destroying a pulp.

The inference may be made from the foregoing that your essayist prefers the application of arsenic to pressure anesthesia for the destruction of pulps, and in a general way this is true, but he recognizes many cases where the latter method may be used to better advantage, particularly with single-rooted teeth, and also that there are some operators whose personal adeptness with the method justifies them in using it almost exclusively. It has always been his contention that the method for any practitioner to employ was the method by which that practitioner could obtain the best results. To follow a hard and fast rule for all practitioners is like putting humanity into a hopper and grinding out a series of models. Each may be true to pattern, but they will lack individuality, initiative and life.

THE FILLING OF ROOT CANALS IN CLEAN CASES.*

BY FRED W. GETHRO, D. D. S., CHICAGO, ILL.

In a somewhat hurried manner I have reviewed the articles on root fillings that have appeared in the *News Letter* and *Dental Cosmos* covering a period of almost seventy years. During this time about two hundred articles have appeared. The mere recital

*Read before the Chicago Dental Society, November 18, 1913.

of the titles of these numerous articles, to say nothing of the briefest sort of comment, would consume much more time than could be allotted to this paper.

In 1887, almost thirty years ago, one of the most celebrated dentists of that time said that so much had been written about root fillings that he considered the subject threadbare, but a cursory examination of the literature since that time would dispel any such fear. The removal of pulps and the filling of root canals is in many teeth so complicated and uncertain that it will always be a live subject for discussion. When we operate in such cases we are working in the dark. I know of nothing in our field that requires more detailed knowledge of the anatomy of the tooth, combined with good judgment and fine technic. Certainly in this part of dentistry no man ever acquires perfection. My knowledge of dentists would lead me to name many men as practically perfect in almost any other branch of our operating, but I know of no recognized man who claims perfection in root filling or is entitled to such a claim.

The history of the beginning and development of pulp removal and root filling from the days of cauterization of the pulp to the present time is decidedly interesting. It is at times pathetic when we think how the dentists of the earlier period were pressed to the utmost hoping to find something that would be a success. A mere mention of the various materials used and the reasons given will show that they tried everything. Prior to this period of pulp capping and root filling it was the accepted practice to extract in all cases where the pulp was exposed, regardless of how or where it was exposed.

One of the first methods for saving pulpless teeth, used by a few dentists, was the placing of a tube in each canal, extending these tubes so that when the permanent filling was finished the tubes would be flush with the completed filling. This was to act as a drainage tube, but I will spare you the details of the manner in which the patient was supposed to keep this cesspool clean.

I would not have you think I am looking lightly upon the ability of our predecessors in root filling or in other lines of practice. When we take into consideration that during this period dentistry was in its infancy and that little was known of antiseptics and sterilization, the results obtained by some of the earlier dentists

was little short of marvelous. Comparatively, some of these men were giants in their work.

ASEPSIS.

On looking over the articles on sterilization, beginning in 1839, I found only one article on this subject prior to 1882 or, stated in another way, only one article on sterilization appeared in this dental journal during the first thirty-five years of its existence. When we consider that the journals were practically the only methods of disseminating knowledge, it is little wonder that many men were having failures when each was trying to work out his own salvation. The first reference to the use of rubber dam in treatment of teeth that I found was by Dr. Chase, in 1874. The first article which advocated absolute cleanliness as a very important factor in treatments was by Dr. S. G. Perry, in 1883. Vol. 25, page 185.

The opportunities of the dentist for direct infection of his patients is not recognized by the public and is not fully appreciated by the profession. To operate under strictly aseptic conditions is not always possible, but we should approach this ideal as nearly as conditions will permit.

In all cases and under all circumstances the rubber dam must be in place. Much could be written on the importance of the proper application of the rubber dam so as to insure an adjustment that will not leak and will give the maximum of access and light, but I will only take time to mention the importance of sterilizing the field of operation after the dam is in place.

Every root canal instrument should be sterilized just before it is used in the canals. The fingers which are used to wind the cotton on the broach should also be sterilized. The gutta percha points should be kept scrupulously clean and should be washed in alcohol just prior to use. It is not necessary for the fingers to come in contact with the cones during any part of the operation for up to the time the cones are attached to the plugger point they can be manipulated entirely with the pliers.

MATERIALS USED IN ROOT FILLINGS.

The following is a partial list of the various materials used in root filling, taken from our literature: Asbestos, cotton, silk, wool, paper, tannic acid, and oxychlorid of zinc, cotton imbued with alum water as a temporary or trial root filling, orange wood

and almost every other kind of wood saturated in phenol, fiddle string dipped in creosote, gold, paraffin wax, copper thread, floss silk, white shellac, gum copal in ether, animal charcoal and iodoform, bees wax, paraffin impression of canal and then making a metal filling from that impression, carbolate cosmoline, thread, lint, lead, iodol, vaseline carbolic, marine lint saturated in tar, wires of various metals which includes broken broaches, sealing wax, crystals of iodoform then using a heated instrument to fuse the contents in the canals, coal dust, sponge, putty. Please do not think that any of the materials mentioned are imaginary; they are all copied from our dental journals.

Some advocated broaches in combination with gold, tin, cement and chloro-percha. Many used oxychloride of zinc for lower teeth and gutta percha for uppers. In another article the author claims to use oxychloride of zinc, celluloid, copper-thread, white shellac and gutta percha.

In 1856 Dr. J. S. Clark published the first article calling attention to a method of filling root canals with gold, although it is recorded that a Dr. Hudson used gold for the same purpose as early as 1830.

It was advocated by some that different materials were required in different temperaments. I have wondered how a patient might feel if he knew that his temperament indicated coal dust, sponge or putty for root filling.

Many of these fillings were used in combination, some using three or four, the first to seal the apex or place in contact with the vital end of the pulp, for many believed and strongly advocated that the best practice was to leave $\frac{1}{8}$ or $\frac{1}{4}$ of an inch of the vital pulp at the apical space.

In addition to the claims made for the precipitate of iodoform for root filling this material is applicable as a treatment to all forms and stages of diseased tissue. Exposed pulps, abscesses, pyorrhea or diseased antrums can all be effectively and quickly cured by this method of treatment. The author also claims that if a part of a diseased pulp remains in the canal it will do no harm, for the precipitate of iodoform will envelope any remaining tissue and forever hold it incased in solid iodoform. And the climax reads this way—out of 600 cases treated, only two were known to be failures. I am not assailing this particular method, but I am using it as an illustra-

tion for there are innumerable remedies on the market today all claiming similar results. The point that I would make here is to warn the younger men against the various "cure alls" that are being forced upon the profession by clever advertising and smooth salesmen. I do not attempt to explain the wonderful claims made by individuals or why the profession has had such wonderful success with so many different so-called "remedies," many as unscientific as they are ridiculous.

The first reference to chloro-percha followed by gutta percha cones, using practically the same methods of operating that we now use, was made by Dr. H. J. McKellops, in 1881, vol. 23, page 240. It should be remembered that most of the operators of the earlier days were placing root fillings with the idea of easy removal for treatments in case of trouble. This method is entirely at variance with our ideal filling, for we recognize that when we place a root filling it should be absolutely permanent.

It should not be necessary for me to say much on the subject of access for I am to assume that with canals clean and ready for filling, good access has been obtained. It would not be amiss, however, to mention that many of our failures are due to poor access. It is unfortunate that in the removal of pulps we have to cut away so much good tooth structure, but good access is imperative and we must make this sacrifice of good structure so that we may have unobstructed access to the pulp chamber and various canals. We must likewise have access into the canals to the apices. Here we find a serious difficulty for many of the smaller canals cannot be made accessible by the ordinary methods. Enlargement of many of the root canals is necessary for the thorough removal of the pulp. A detailed knowledge of the shapes of the various canals will convince any one that in many roots it is absolutely impossible to remove the contents without enlarging and thereby changing the shape of the canals.

For this enlarging I know of only one safe method, and that is the barbed broach. The use of drills of any kind is to be condemned for their use in some canals will surely result in disaster. By means of the barbed broach skillfully used we may enlarge any canal that can be entered to any desired size. There are canals so small that even the barbed broach cannot enter. In these extremely small canals where the smallest barbed broach will not enter we

can frequently use a smooth broach successfully. By roughening this broach and using it in the same manner as described for the barbed broach we may enlarge the canal. These smooth broaches can be roughened by rotating the broach between two flat files or between a flat file and a piece of hard wood. After using the roughened broach we will usually find the canal sufficiently enlarged to permit the smallest sized barbed broach. It must be understood that the barbed broach is a very delicate instrument which must be used with great care. A barbed broach should never be rotated within the canal, but should be used as a reverse file. It cuts on withdrawal from the canal. The use of acids for enlarging is not advisable.

The ideal root filling is one that is indestructible, non-irritating and must be capable of being manipulated so as to hermetically seal the cavity. The material that comes the closest to filling these requirements and the one that is recognized by the better men and taught by most of the reputable schools is gutta percha. Gutta percha is mentioned as early as 1848 (Vol. 1, No. 3, *News Letter*) for temporary stopping, etc., but the first mention for root filling I found was by Dr. A. P. Merrill in 1867 (Vol. 9, page 264, *Cosmos*). Gutta percha, as described later, should be used exclusively in a great majority of our root fillings. Chloro-percha has a place in root filling, but its usefulness is very limited. If root canals are made accessible following a method mentioned later in this paper, I am satisfied that chloro-percha should not be used in more than 10 or 15 per cent of our root fillings.

The technic for root filling can be divided into two classes—ordinary sized canals and small canals. As an illustration I will classify the lingual roots of upper first molars and lower first molars as ordinary sized canals, the same as all the upper front teeth and all bicuspid excepting the upper first. Mesio-buccal roots of upper molars and mesial roots of lower molars, lower incisors and upper first bicuspid will be classified as small canals. The technic for filling an upper first molar will be given because it includes both classes and because we are called on to fill this tooth more often than any other in the mouth. The root canal plugger is used to secure the approximate size of the foramen and a gutta percha cone is selected, the diameter of which is slightly larger. At the time of measuring the foramen we can also note the length of the

canal. It is a mistake to use a long cone, for it cannot be properly handled and it is impossible to pack such a cone and seal the cavity. A cone should not be longer than three millimeters. The root canal plugger should be heated and the cone attached to the plugger, which is then placed on the tray ready for immediate use. Eucalyptol must now be carried on a broach wound with cotton to moisten the entire length of the lingual canal and for this purpose it is important that the broach be of proper size so that it will not go beyond the apex and injure the peridental membrane. The slightest injury to the membrane might produce a hemorrhage which would result in an imperfect sealing of the foramen. The tooth may be slightly warmed by the hot air syringe and the gutta percha point dipped in eucalyptol and immediately carried to the apex. While the indication of slight pain from the patient may mean that the cone has reached the apex, that sign is by no means infallible, for air forced ahead of the cone may account for this sensation of pain. The use of eucalyptol is indicated for several reasons:

First—It will displace moisture, because eucalyptol has a greater affinity for dentin.

Second—It is a slight solvent for gutta percha and causes the gutta percha to adhere to the wall.

Third—It is a lubricant, making it easier to force the gutta percha into the small canals; and

Fourth—It is antiseptic.

The filling of the root to the pulp chamber should continue in the same manner described, excepting that the cones should become relatively larger in diameter due to the tapering of the canal, and the tooth should be warmed several times to insure the thorough packing of the gutta percha. If the root canal plugger is sufficiently large so that the gutta percha will be forced ahead of the point instead of puncturing it a great amount of pressure can be used during the entire process of packing, resulting in a dense solid filling that will hermetically seal the canal.

The only variation in the filling of the mesio-buccal and disto-buccal canals is that I would usually use chloro-percha to help in the filling of these smaller canals. But this is easier said than done. In these smaller canals I am satisfied that many times we fail because our pluggers and broaches are not delicate enough. Another common cause of failure is the too generous use of chloro-percha

or using chloro-percha of improper consistency. The smallest amount of cotton wound tightly on a broach with a small amount of chloro-percha carried to the apex or as close as possible should be followed immediately by a cone that has been previously prepared and this should be pressed, if possible, to the apex. Much of this must be done very quickly and it is essential there be no failures in any part of the operation.

If the cotton comes away from the broach when the chloro-percha is carried to the canal and the operator has to stop to correct that fault, he usually finds that by the time the gutta percha cone is placed in the canal sufficient chloroform has evaporated so that the chloro-percha is a detriment instead of a help. Some men can wind a small amount of cotton on a smooth broach so that it will stay, but many cannot. Many of these things are matters of little detail, but anyone, with a little practice, can master them.

It will be noticed that nothing has been said about filling root canals in teeth with large foramina found in the mouths of young people, due to the roots not being fully formed. Lack of time has prevented much that might have been written about this part of the subject and also about the filling of the roots of the deciduous teeth. Suffice to say that every dentist should have a chart showing the calcification and absorption of the deciduous teeth and the calcification of the permanent teeth. Such a chart should be in a very accessible place, possibly on the inside of the cabinet door, where it is always convenient for ready reference.

A paper on this subject would not be complete without some reference to the invaluable use of the X-ray in pulp treatment and root filling. By means of the X-ray we are now able to know where we have succeeded and where we have failed, and judging by the many pictures I have seen the failures are greater than the successes.

The silent objection that I imagine many in this audience will make to this method of root filling or to any similar method is that it consumes too much time, that they cannot afford to put as much time on this part of the operation. It is admitted that to prepare root canals and place root fillings in the manner described will in many cases consume much time. If we do our plain duty towards our patients we will always do the best that is possible. If there is any part of dentistry where we should put forth our very best efforts, that place is in the treatment of teeth and the filling of the

root canals. If our patients do not appreciate the importance of our efforts in this particular part of our operating, it is because we have failed to properly educate them. I cannot close without adding that the average low fees charged for treatments is out of all proportion to the service rendered.

A FEW THOUGHTS ON DENTAL AND OTHER LITERATURE.*

BY DR. M. A. WEBB, CHICAGO, ILL.

This paper is more properly along the line of the use of literature, and is an assembly of thoughts positive in their presentation. For this reason I have divided the paper into a series of affirmations, each one being numbered. This makes possible a clearer distinction between them in case of discussion. In so short a paper it is impossible to do more than give the thought without elaboration upon it.

The four great professions owe their origin and growth to the needs of mankind.

The law takes care of our rights, theology makes us better and happier, while medicine and dentistry look after our health, and lengthen the span of life.

A profession becomes learned when the great body of its followers, from a desire for deeper knowledge, begin to think, to investigate, to examine into the truth of new theories, to try to discover the primal causes of a departure from the normal and to find a remedy; thus, becoming truly professional, and thereby establishing a literature broad in scope, and masterful in composition.

Dental literature has been developing rapidly because of a multiplicity of new theories, discoveries, and methods of practice, which necessitates a broader knowledge if we would keep in touch with our opportunities.

Knowledge is both theoretical and practical. The theoretical is a concept of ideas, while the practical is a working out of those ideas to get their true value.

*Read before the West Side Branch of the Chicago Dental Society, Oct. 29th, 1913.

It is only by the study of theory that we are able to separate the false from the true, and to do so requires much thought and investigation.

All scientific truth is progressive, so that what is true today, may be rightly questioned tomorrow, because of later discoveries.

It is in seeking after the truth that we gain knowledge, because, if we could know truth in the absolute our progress would cease, and that would mean infinite knowledge, which we can never attain.

It is well to read what others may write, but it is also well to think for ourselves, and act accordingly.

It is better to remain in doubt than to accept statements made by others as true without investigation, but when made by those of well known ability and long experience, they should have our most serious consideration.

We are wise who keep our ears turned in harmony with intuitional thought forces, as those must who lead in the advance of ideas either material, moral, or spiritual for the betterment of mankind.

The reason why we as dentists require a broader knowledge than those who follow most lines of endeavor is, because there are so many arts and sciences, in part, included in our practice.

It has been stated that we, as a body, are not readers, and that we do not subscribe for our periodicals, or buy our standard works as we would if we were a learned profession. If this is so it is because we give most of our thought to the *how* of doing things, and very little to the *why* of them.

The questions of how and why in doing things are the essence of knowledge, and one should never be used at the expense of the other, especially in the treatment of disease.

It is not a lack of opportunity, but rather because we do not appreciate the necessity, if our library contains few books of a professional nature.

A well selected library is, in itself, an incentive to study, which we should invite as an ever increasing pleasure through life.

Study leads to the habit of thinking, and thought moves the world of matter, as well as mind.

All things done by the hands of man are seen in the eye of the mind, before they are fashioned in matter.

Our reading should be of a general character including fiction and science for recreation. I prefer astronomy among all the sciences, because from its nature, we rise to a higher plane of thought, becoming better men, while our low conceptions of existence fade away in the light of universal immensity.

Our every professional duty requires the best that is in us, if we would fit ourselves to improve some present method of doing things, make a new discovery, or advance a new theory of benefit to ourselves, our profession, and through it to the world at large.

A small act often leads to a great thought, which finally demonstrates a great truth in science. As an illustration, we all know how the thought, stimulated by a falling apple, proved the law of gravitation.

One of the greatest helps in our professional life is our periodical literature, and it should fill a large place in our esteem.

It is really a cyclopedia of thought from the best minds in the profession, and after reading, it should be bound and placed on our shelves as a future reference, besides it is a true history of dental progress.

I have never destroyed a journal in the past thirty-six years, and of course, have many volumes of them. The odd numbers and sample copies I have bound in what I call miscellaneous volumes.

I also have an index which covers the important things in them, adding to their convenience, in case of reference. There are at least forty-two different publications among them, only a very few, however, are in print today, any many of them were only issued a few months.

It is a lesson to those in the formative period of their professional lives, that every thought and act means much in the final summing up. It means an evolution of the best, out of a darkness of imperfection, into the light of professional excellency.

Our society meetings and clinics are of vital importance, but should not lessen our desire for the stimulation of our mental faculties by systematic reading, because it broadens our vision, and strengthens our powers of reason and understanding.

In the degree that we love our work, we will be interested in those associated with us in it, and would like to know them personally, but if that is impossible, then at least through what they

write as editors of our books, or as contributors to our periodical literature.

There is nothing which should occupy a higher place in the lives of professional men than books. They are, as it were, the dead brought to life. They bring youth back to the aged. They show us ourselves as nothing else can, and they can tell us the truth without hurting our feelings. We are made acquainted with the thoughts of the ages. We visit all countries, and hold communication with all peoples, in fact, the world is at our feet, if we cultivate a taste for reading.

We know a man well when we know his thoughts. It is not the cut of his coat, nor the color of his eyes that reveals his personality, but what he says or does.

The founders of our profession had the inspiration and ability to struggle through many defeats and failures, with an ever-present purpose of doing their best from day to day, which, in connection with their giving freely of their experiences to their fellow workers, has helped to make you and me members of an honorable profession, with its rapidly growing literature, and wonderful manipulative ability.

Our investigators are inquiring into the first causes of dental troubles as never before, and also the effect these have on the general system. This work, as it is becoming known is awakening the conscience of the public to the point of permitting dental examination of public school children, and, also, bringing about a more universal teaching and practice of oral prophylaxis.

This can only grow to fruition, however, with the education and co-operation of the patient. Its ultimate success depends upon us, who have charge of the mouth, and if we wish to be in the front ranks we must be first in knowledge, first in ability, and first in the hearts of our patients.

As we travel our dental journey we must record every landmark, every milestone, and every cross road, as a help through those difficulties sure to confuse us, and there is no better way to do this than with a comprehensive and well indexed library.

PYORRHEA ALVEOLARIS, ITS CAUSE AND CURE.

BY H. E. BLILER, D. D. S., CHICAGO, ILLINOIS.

The cumulative refinements of years are being clearly reflected in achievements in dental science and progress. You are progressing or retrogressing—did you ever think of that? It is gratifying to all of us to be classed as up-to-date—fully abreast of modern thought and action, the time having come when dental work, with artistic merit, strength and cleansing surfaces, gratifying to the dentist is imperative and being done by the great majority of conscientious dentists interestel in the uplift. We will concern ourselves for the present with the above heading, being of vital importance to us all.

As a consequence of the immense amount of light thrown in recent years on the morbid phenomena brought about by the toxic materials elaborated within the organism, constipation has ceased to be regarded as a condition of trivial importance. As a matter of fact, the almost universal attitude of indifference toward constipation has given way to a keen appreciation of the grave dangers to which the retention of intestinal refuse often expose the entire organism.

Our present knowledge of intestinal putrefactive processes and their related metabolic perversions, which are commonly manifested by toxemias of various degree of intensity, is such that we no longer regard constipation as other than a condition worthy of the most skilful and painstaking treatment. We now know that a stagnated colon bears a casual relation to a great variety of anomalies of metabolism—that it is a prolific source of functional disturbances.

There can be no gainsaying the fact that much of the confusion concerning the morbid phenomena brought about by the toxic products of metabolism is due to the widespread currency of conflicting theories and the ambiguity of those responsible for their promulgation. A more general and perfect understanding of the condition commonly designated autointoxication would now obtain had there been less theorizing and verbosity on the part of those who have attended to the subject. An unwarranted amount of perplexity concerning the morbid processes induced by the poisonous products of metabolism has resulted from a too hasty acceptance of unsound

theories and a too generous use of indefinite terms; the literature on the subject of autointoxication has been weakened through the introduction of defective speculation and verbal diluents.

The skepticism with which the majority long continued to regard the whole doctrine of autointoxication is no longer in evidence; all save the most backward and stolid are now well aware of the fact that derangements of metabolism are frequently attended with the production of poisonous materials that exert a profound influence on the general economy. Indeed, it is now universally conceded that autointoxication is the underlying cause of an exceptionally large group of symptom-complexes.

That the same bacteria of toxic matter that cause carbuncle or appendicitis and many other local morbid manifestations cause pyorrhea alveolaris, there is absolutely no question. Autointoxication, (constipation) is defined as the inadequate elimination of germ infested fecal matter, in other words the retention of toxic material, poisonous gasses and bacteria, which permeate the entire system, attacking the weakest point of resistance, causing such local morbid manifestations as pyorrhea alveolaris, carbuncle, appendicitis and many other abnormal conditions. Bacteria gravitate to points of least resistance; this has been fully verified. Clinical deductions and experiment will accord with the above facts. Too many discordant theories impair our proper interpretation on questions of paramount importance.

The pharmacologist and clinician, by their diligent research work, and deductions, place therapeutics on a more rational basis. We know by experience and clinical conclusions, that constant drug stimulation and elimination is indicated, and necessary, due to our Epicurean habits. Just as long as we indulge in excesses, just so long are remedial agents essential to maintain healthy conditions, the excretory organs not being able to throw off all toxic matter. We know empirically, that salines, followed by a vegetable cathartic will relieve and restore systemic disturbances in putrescent and abnormal conditions of the entire body, and the alveolar process (pyorrhea alveolaris), but we do not know how or why. We know further, that bedside observations frequently controvert laboratory precepts, but we do not know why. Should we blindly adhere to a chain of plausible theories by depreciating and rejecting facts, because we do not know why? One must concede that scientific reasoning and correct understanding will tend to clear the atmos-

phere of mysticism and erroneous conceptions formed on many vital problems.

I have personally for several years been affected by autointoxication; I am strong and active, and apparently normal, with regular elimination of fecal matter. The local morbid manifestations in my case are carbuncle and pains in the appendix. In cases of occupational diseases and industrial poisoning, eliminatives are clearly indicated as remedial agents, stimulating renal activity. Herman Boeker, Ph. G. M. D., from personal experience and clinical observations, maintains that most all diseases are directly traceable to the gastro-intestinal tract—that closer attention given to auto-intoxication as a source of disease will solve many of the most perplexing problems in internal medicine. Neither can we have an unalterable classification of the toxics or toxemas. Bacteria gravitate to those parts in which the least resistance is met. Billroth found bacteria in small numbers in the upper bowel segment, increasing in the intestines—and the largest number in the fecal repository, or colon. The number of bacteria found in the alimentary tract, is almost beyond computation in normal as well as abnormal conditions. Buchard, of Paris, lays great stress on auto-intoxication as the prime factor in most all morbid phenomena, favoring circulatory stasis of the liver, and causing, in a measure, morbid conditions and metabolic disturbances, as in gouty and rheumatic affections. Personal, as well as clinical experience, confirms my belief that appendicitis and carbuncle, from which we get fatal toxema—also pyorrhoea alveolaris—are local morbid manifestations of gastro-intestinal poisoning and infection, attacking the weakest point of resistance—varying in different individuals. Theorists, no doubt, will take issue—but the facts remain; they are all pus-producing and tissue-destroying toxemas, and by using the same eliminatives, they all disappear (in primary stages), and normal conditions are restored. Our social relations, with excesses of food and drink, are not conducive to natural immunity from autointoxication. To maintain normal conditions, the necessity of constant cleansing, and removal of germ infected fecal and toxic matter is apparent. When in distress, look within for redress.

CAUSES.

Excessive eating, negligence. Excretory organs unable to eliminate all toxic, fecal matter, causing systematic disturbance and imperfect metabolism.

SYMPTOMS.

Local, morbid manifestations are, phagedenic, pyorrhea alveolaris, sluggishness, headache, biliousness, carbuncle, pimples, languor, appendicitis, tri-facial neuralgia, and many others.

DIET PREVENTION.

Eat moderately, and of meat sparingly—once daily. Preferably vegetables and fruit diets—such as rice, the corn products, pineapple, apple sauce, prunes, oat meal, cereals, whole wheat, and wheat bran occasionally, etc., avoiding pastries.

TREATMENT.

When any morbid symptoms appear, cleanse the gastro-intestinal tract, taking internally a saline, followed by a vegetable cathartic nightly for a fortnight—gradually diminishing the doses. Olive oil will assist, twice weekly. Repeat above treatment every three months and you will retain normal conditions, with good complexion and sweet breath. Many people rust out their vital organs instead of wearing them out.

OBESITY.

This being a rational treatment for obesity, with exercise, obtaining health and vigor, by relieving systemic stagnation.

If your patients manifest any of the above morbid phenomena, or have aching teeth, without any apparent cause, such as tri-facial neuralgia, apply the saline treatment, and you will get gratifying results, as I have done in many and all cases. When you cure them of pyorrhea alveolaris you also cure them of other morbid conditions and restore normal health.

RECUPERATIVE POWER GONE.

When the vitality of the alveolar process is gone you cannot restore it, any more than you can restore a lung lost by tuberculosis. Remove the very loose teeth, and bridge across, and the remaining teeth will last indefinitely. The local treatment is very essential, helping materially the systemic treatment. The reflex action of pus-discharging pyorrhea alveolaris, is very deleterious to the entire system, as we all know. Sober thought, by men qualified to speak from clinical deductions and observations, will verify my contention, signaling a praiseworthy innovation.

I append the following cases which were affected with auto-intoxication, the cause of their morbid conditions, and were all cured by the use of eliminatives which illustrate my point.

Case 1. Mr. W. L. S., a young man twenty-two years of age, came to my office June first. He complained of soreness and bleeding of gums after brushing and of a very fetid breath. Examination showed an aggravated case of phagedenic pyorrhea with very little accumulation of sub-gingival calculus. The acute attack was a veritable fire, with a large pus pocket at angle of the jaw. I



Case 1

cauterized with H. C. L., H_2SO_4 , healing it. But the same condition would appear at the opposite angle, and would keep shifting back and forth like a smouldering fire. The teeth were loose. There was no history of venereal trouble nor of any drug taking. No signs of any other disease were present. I gave him the usual local treatment with no avail. Antiseptics seemed of no benefit. After treating him for two months, I decided that I had here a systemic basis. I placed him on a tonic eliminative treatment with the result that in less than ten days all the former trouble had disappeared.

Case 2. Mrs. C., aged thirty years, giving no history of venereal taint, nor systemic diseases, came to my office with the recommendation that all her teeth be extracted. Same indications were apparent as in Case 1, the whole mouth being affected. Very fetid breath in both cases, had plethora anemia. Local treatment of no avail in either case. Case 2 referred to me by family physician. The same treatment was instituted and the result was equally as satisfactory as in the preceding case.

Case 3. J. I., age 65. Two severe attacks of phagedenic pyorrhea alveolaris, had plethora anemia. Three local treatments.

Case 4. Mr. W. L. P., age 30, severe attack of pyorrhea—fetid breath, also plethora anemia and sluggish—one local treatment.

Case 5. Miss S. M. B., Vandalia, Mo., age 30, chronic case of fetid breath. Biliousness of long standing, causing severe headache, sallow complexion, had also chlorosis anemia. No local treatment.

Case 6. W. J. M., age 25. Ashen color, sluggish, no vigor, tri-facial neuralgia, had chlorosis anemia—no local treatment.

Case 7. Mr. M. J., age 21, pimples on face of two years' standing, sluggish, no vigor, pale, no local treatment.

Case 8. Miss S., age 19, very fetid breath—anemia—teeth being kept in A1 condition, no local treatment.

Case 9. Mr. S., age 50, Chicago, fetid breath, sluggish, bad condition physically—plethora anemia—no local treatment.

Case 10. Mr. R. B., age 35, Chicago. Pulmonary tubercular patient accompanied by plethora anemia—fetid breath, sluggish, ashen color, and also of severe coughing at night, used also with the salines, disinfecting vapor for air passages and bronchial tubes, progressing favorably.

PROCEEDINGS OF SOCIETIES.

WISCONSIN STATE DENTAL SOCIETY, FORTY-THIRD ANNUAL MEETING, MADISON, JULY 22-24, 1913.

DISCUSSION OF DR. BLAIR'S PAPER ON "ANKYLOSIS OF THE MANDIBLE."

DR. M. N. FEDERSPIEL:

Dr. Blair, in his interesting and instructive paper, shows splendid results in a number of extreme cases of ankylosis. He no doubt has through his long experience as a surgeon become satisfied that in order to establish permanent relation it can only be gained through a properly performed operation. When I say properly performed operation I cannot help but emphasize these words, *properly performed operation*.

Let me tell you, ladies and gentlemen, that not only means surgical skill but a familiarity of the anatomical structure and

functions. In order to be skilled in the treatment of any pathological condition it is of the highest importance that one should understand the embryological formation of the parts. Especially is this true of the temporo-mandibular articulation in its relation to dental facial deformities.

Keibel and Mall in their book on embryology claim that this joint is developed between the membrane which covers the condyle of the mandible and the periosteum of the squamosum. In the loose tissue between the two a condensation marks the beginning of the differentiation of the discus articularis. On each side of this discus a joint cavity develops; each joint cavity is throughout life lined by fibrous tissue. Beneath the joint periosteum of the mandible and of the temporal bone a thin layer of cartilage is produced. According to Wallish, in the new-born the tuberculum articulare is still undeveloped and the condyle is flatter than in the adult—the condyle reaches its definite form and the tuberculum is developed after the teeth appear.

Personally I am of the opinion that the temporo-mandibular articulation develops in shape and depth during the period of tooth eruption. I am satisfied that its position, shape, size, etc., is influenced by the direct reaction of the muscles which control the mandible.

I have observed in the history of a number of cases of mandibular retroversion that the patients prior to the eruption of the permanent teeth showed no signs of malocclusion. That after the child began to breath through the mouth instead of the nose the mandible slowly and gradually drifted distally and the upper anterior teeth protruded.

I have come to the conclusion that this change of malposition of the teeth is brought about by unbalanced muscular force. Nasal stenosis will force the depressors of the mandible to remain active in holding the mandible backwards and downwards while the levators remain relapsed. Any form of chronic nasal stenosis will in time influence the shape of the temporo-mandibular articulation and surrounding area, which if not corrected during the period of growth will render the prognosis unfavorable in correcting mandibular retroversion by orthodontic procedure.

I merely want to point out that by understanding the embryological and anatomical formation of this joint, one can be a better

judge in knowing the outcome of so-called diagnosis of certain mouth malformations, and guard against putting off treatment until after the period of tooth eruption. Of course I have reference to mandibular anteversion and mandibular retroversion. This Dr. Blair has pointed out.

In regard to the etiology, I fully agree with Dr. Blair with this exception, that I do not believe that 50 per cent of all cases of ankylosis are directly due to an injury produced by a blow or a fall on the chin.

In my observation of ankylosis cases I find that the majority are due to suppurative inflammation in or around the joint.

I recall a case of a child that had been suffering from a tubercular osteomyelitis which enveloped the ramus of the left side. She had been operated upon a number of times and finally healing was obtained. But gradually after that time the child found it more difficult each day to open the mouth. This was due to scar formation in the region of the masseter muscle. In this case the mother of the child informed me that the child fell while roller skating and she believed that the limitation of movement of the child's jaw was due to this injury. I, however, was satisfied that this trouble was due to scar formation, and informed the mother that unless this cicatricial contraction of the cheek and mucous membrane was removed that the outcome would be unfavorable to the child. The mother, however, refused any operation and one year later she again called on me and I found that the motionless jaw during this time permitted its joint to take on a passive inflammation with the exudation of plastic lymph, which later became organized resulting in what I believe was a tough bony inclusion. This child's jaw was firmly set and her mouth was filthy with deposition of food between the teeth and quite a number of the teeth indicated decay.

The formation of cicatricial bands is the usual result of extensive ulceration and loss of tissue. The cheeks and mucous membrane of the mouth are exceedingly elastic in their normal condition, permitting a very considerable expansion without injury to their structure; but once the character of this tissue has been changed or replaced by a mass of scar tissue the elasticity is lost and it will in time completely and effectually bind the jaws together as would a bony ankylosis of the articular surface. I also might add

that the bony ankylosis is oftentimes the outcome or secondary of cicatricial contraction of tissue of the cheek.

The treatment as outlined by Dr. Blair seems to me an ideal one and should afford permanent relief to many cases of true bony ankylosis. But in cases where the ankylosis is directly due to scar formation it seems to me that permanent relief can only be obtained by the removal of the scar tissue and replacing it with epithelial tissue. I must confess, however, that whenever I have attempted this form of operation the results have never been what I would call satisfactory; because I always found that complications would arise and while I seemed to remedy one evil I created another.

In cases where we find extreme scar tissue I am coming to believe in a modification of Rizzoli's operation for forming an artificial joint in front of the cicatrix. This operation consists in dividing the soft tissue below the jaw and in front of the cicatrix, then rounding the ends and keeping them separated by a silver plate which lies over each end of the bone and is held there with silver wires. I have attempted this operation in one case and thus far have permitted the patient to get along nicely in masticating food and keeping the mouth in a clean condition. This case is still under observation and I hope to make a report on it at a later time.

The mechanical treatment only gives temporary relief and I have never known of a case wherein the results have been permanent.

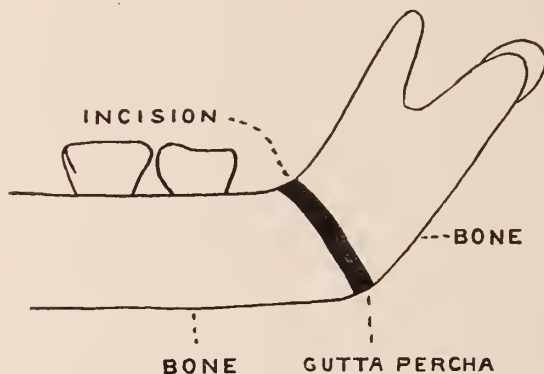
Credit must be given to men who were the pioneers in this work and whose results and failures have been the stimulants for others to do better work. It is well for us to remember that Holt, Diefenbach, Jeache, Rozzoli, Esmarch, Goodwillie, Mears and Glengon have forged empirical methods which have encouraged Blair to give to the world a newer and better operation for permanent relief in many cases of extreme jaw ankylosis.

DR. T. W. BROPHY:

Regarding the paper of Dr. Blair—I feel that it is scarcely necessary for me to say anything. Were I with you, I assure you I would timidly approach the discussion of the subject "Ankylosis of the Jaw" because I would be in the presence of a great master—a man who has contributed as much, and I think quite likely more, to our profession on this subject than any other mem-

ber. It would be impossible for me to use words which would adequately express my admiration for his achievements in the field of oral surgery.

Long ago I resolved that the usual operation of opening into the glenoid fossa in the treatment of a true ankylosis of the temporo-mandibular articulation was not the best course to



pursue. This may not be in accord with the views of Dr. Blair, but I am sure I have seen his writings and illustrations in which he has described the making of an artificial joint, and in my own experience which has extended over a period of thirty years in this work, I am satisfied I am able to secure better results by making a curved incision through the bone just anterior to the ramus, placing a piece of gutta percha between the ends, waiting for the ends of bone to heal over, then removing the gutta percha and thus securing a perfect joint.

The complaint that has hitherto been made, that the divided bone may reunite and defeat the aim of the surgeon to re-establish motion, is met and overcome by the adjustment of the piece of base plate gutta percha between the ends of the bone that has been divided. This, besides, is a very simple procedure without the possibility of disturbing the seventh nerve and causing facial paralysis. Having operated in this manner many times with gratifying results to the patient, I commend it as a most satisfactory method of treating this very distressing affliction.

NORTHERN ILLINOIS DENTAL SOCIETY,
OCTOBER, 1913,

DISCUSSION OF DR. CLEMMER'S PAPER.

DR. M. L. HANAFORD, ROCKFORD.

We, especially those of us who are no longer young, must take off our hats to the enthusiasm of the essayist, and all must recognize that he has the courage of conviction. It is good to see, it stirs our blood, though how Clemmer can hope to make anyone "hopping mad" with such an earnest presentation of the subject nearest his heart, is more than I can see. I only fear that some of us may make him hopping mad, and in that case if we may argue from his snapping eye and terrible earnestness, there may be some one injured and it will not be the essayist. As for the argument of the paper, Mr. President, I cannot help the feeling that the essayist has erected a man of straw, and then turned his battery of guns upon him, with the foregone conclusion that the poor man of straw is riddled by the shot of his logic. I cannot follow him "away back to the dawn of life," or through Biblical literature to the September morn of modern art, thence to the beasts of the field and the fowls of the air to man, and deduce therefrom that "primitive pain is fear;" neither can I accept his statement that "fear is an inherent quality of life," a statement which cannot be reconciled with the fundamental thought of the paper—that pain is thoroughly and necessarily bad and ought to be avoided almost at all hazards.

I have heard it said, and I believe it, that pain is one of the most beneficent things in the world. Certainly it needs no argument to show that it is necessary to our preservation. If I feel no pain I may be frozen or burned to death; I may lose my eyes or all my organs of sense, my teeth will decay and fall to pieces, and I will die years before my time but for the warning of suffering and pain.

But if I accept that warning and for the care of my dental organs visit Dr. Clemmer or some other good dentist, I forestall the evil consequences of what would otherwise be criminal neglect and perhaps live happily ever after.

I am sorry Dr. Clemmer drew such a tragic picture of the visits of his patients to his chair. I want to say that I do not accept it as typical. I may modestly say that I have many, very many, patients who "come with a song on the lips" or a good story to exchange preliminary to the work in hand. Our patients are our friends, and I submit that our friends will not regard us as "butchers" nor do they regard themselves as "victims," on the contrary, operator and patient together undertake with mutual interest, some work which has some unpleasant features and some pain possibly, but the results of which are anticipated with satisfaction by both alike.

So I desire to go on record as objecting most strenuously to the premises, I might say the state of mind of the essayist. The implication is emphasized that the preparation of cavities is the worst if not the only painful procedure and joy awaits its amelioration. In my experience I do not find this to be the case. Other phases of dental operations to which analgesia would not be applicable are much more serious and hard to deal with. Now, am I for nitrous oxide and give oxygen analgesia or against it?

If the essayist or any other advocate of it will limit its use to those very rare cases where the question is between analgesia and a poor operation or no operation at all, or a shattered nervous system from excess of sufferings, it seems to me there can be but one opinion. But a general use of our anesthesia for slight or moderate or anticipated pain in cases of patients perfectly able and capable of bearing it, I believe to be wrong.

I leave the consideration of the possible injurious effects of those agents when used repeatedly, to other and more capable hands, only saying that I have heard it said by one worthy of credence, that certain distinctive effects on remote organs, the kidneys for instance, were common and were to be expected.

I am sorry the essayist does "nearly all of his cavity preparation, etc.," with his patients in the analgesic state, and although they "call him blessed" and he gets the money for the five or six fillings he can make at one sitting, I fear he is making a mistake and possibly overriding a hobby.

If the essayist lives and continues to practice dentistry, I

believe the time will come to him when his patients will not judge his professional ability by his power to banish pain, but contrary to their present estimate of him, they will "know what constitutes good dentistry" because he has given it to them for many years.

REPORT OF COMMITTEE ON STATISTICS, NORTHERN ILLINOIS DENTAL SOCIETY.

Your Committee appointed to secure statistics upon some subject which would be of interest and profit to the profession and of value to our patients, decided to take up the study of Gingivitis. We chose this: First, because it is so vitally related to our work upon the teeth on the one hand and pyorrhea on the other; Second, because we have fallen into the almost universal habit of devoting our attention to the care of the teeth and overlooking the gums. This is an age in the study and practice of prevention in the art of healing, and a great deal of work is being done along this line. The work of prophylaxis is conspicuous, and your committee felt that the study of gingivitis would contribute to the success of the result. We recognize, with authorities upon diseases of the periodontal membrane, the fact that pyorrhea invariably starts with a gingivitis and develops to the deeper seated and more malignant disease, that if we are ever to arrive at a knowledge of the etiology of pyorrhea, it must be through careful observation and recording of traces of gingivitis and its subsequent development.

Hence your committee thought that the preparing of even a few charts would stimulate a more careful observation of the soft parts of the mouth, and we hoped that the records might supplement the work done by Dr. A. D. Black, some time ago, a report of which appears in the September 1912 DENTAL REVIEW, a careful perusal of which we would heartily recommend. To simplify this study we decided to reduce the notations to ten (10) using the same numbers which Dr. Black used in his study with the following result:

EXAMINATIONS OF THE GINGIVAE.

16. No contact of teeth, no inflammation.

GINGIVITIS DUE TO

17. Lack of cleanliness.
21. Lack of contact of teeth, no caries.

22. Improper contact or atypical form of teeth.
23. Worn contacts.
24. Caries of proximal surface.
25. Lack of contact, proximal filling or crown.
26. Improper contact, proximal filling or crown.
27. Improper margin of filling or crown.
28. Salivary calculus deposits.
29. Serumal calculus deposits.

The response to the letter and charts sent out was not as general as the committee desired. We believe that this was due to two facts; first, that not every man is a statistician, and second, that probably the matter was rather forced on the association by the enthusiasm of the essayist suggesting it. We sent out 2,000 charts for records, and there were returned 110, or about five per cent of the total number. Perhaps this is as much as we should expect, but we frankly admit we had hoped for more. If, however, out of the 200 members of the Northern Illinois Dental Society, we have found even ten men who will observe and record, it is ample compensation for the labor and expense. We believe that no man has prepared these charts without feeling a decided increase of interest in this most important subject.

The information as tabulated covers 110 patients, their average age being 29.3 years, with a total of 1371 markings or an average of 12.5 per patient. Of the 110 patients examined, there were but five (5) who displayed no areas of gingivitis; this would be about 4 per cent of the total number of patients examined, which shows how very general is this preliminary disease. Probably it would not be unjust to say that all cases of gingivitis are due to neglect on the part of the patient or operator, or both, and would probably be properly marked with Number 17, to indicate: *Lack of cleanliness*. However, according to markings, the most prominent cause was numbered 28; *Deposits of salivary calculus*; of these there were 608. Next to this was Number 29; *Serumal calculus*, of which there were 160. The next in order was Number 27; *Improper margins of fillings or crowns*. This is rather startling as indicating a very common oversight on the part of operators; as this is due not to the patient's neglect, but to the operator exclusively. But following this very closely the next important

marking is Number 17, with total markings of 136, *Lack of cleanliness*, which places the patient a very close second to the operator in negligence and divides the responsibility of this dread disease. The next in importance is Number 21; *Lack of contact of teeth*, with 89 markings. This probably is the one marking which carries with it the least responsibility on the part of those concerned; for, lack of support is something for which neither may be blamed. The next highest marking was Number 26; *Improper contact, proximal filling or crown*; with a total of 59 markings. These, with 39 markings under Number 22; *Improper contact*, and 9 markings under Number 25; *Lack of contact, proximal filling or crown*, indicate how important is proper contact to the health conditions about the teeth and the prevention of gingivitis.

Aside from the markings indicated upon the cards, there have been several cases marked with crosses to indicate that the cause of the gingivitis is unknown. This is not at all surprising, for often it is very difficult to say absolutely what the cause or causes may be.

Your committee is not satisfied with either the work or the report which we are able to make this year; it is but the beginning of a great work which should be continued until it constitutes a real contribution to dental literature. We feel that listening to the report or reading it in a magazine is of little consequence compared with the participation in the work itself. It was the hope of the essayist, and still is, that many of this society shall form the habit of making records for future use, and if this committee is continued, we would urgently request early criticisms and suggestions, that we may be guided to more efficient service. I want in behalf of the committee to thank all those who have aided us in the work thus far, even though they are the ones who have received the greatest benefit.

Respectfully submitted,

M. R. HARNED,

A. D. BLACK,

W. C. McWETHY,

Committee on Statistics.

ODONTOLOGICAL SOCIETY OF CHICAGO.

A regular meeting was held October 6, 1913, with the president, Dr. C. S. Case, in the chair.

Dr. M. H. Cazier read a paper by invitation entitled "Preventive Therapeutics."

DISCUSSION.

DR. T. W. BROPHY:

I have not seen very much of my friend since our days at Rush Medical College. Not long since, however, I had the pleasure of meeting him again in my office at which time he explained to me this device for removing the fluids retained in and about the teeth.

The doctor's appliance may have a very high degree of utility; we may be able by its use to accomplish better results than we have hitherto been able to secure by the old methods. Those of you who have studied the teachings of Doctor Bier of Berlin, Germany, and learned his method of treatment of certain abnormalities by what is known as the hyperemia method would, I think, associate that with what has been presented here, and will see a very close relation in the two methods. Doctor Bier called the attention of the medical world to him by showing that a certain disease might be very easily eradicated by filling the part with an excess of blood which, in the natural order of things, would be taken away by the circulatory system. Hence, you will find many surgeons of the advanced class everywhere referring now and then to Bier's hyperemia method of treating inflammatory conditions.

I was especially interested in what the doctor said on the subject of prophylaxis. Prophylaxis is the foremost of all things in this world as far as we medical men are concerned. It is a matter of great satisfaction to me and I think I express the feelings of all present as well as absent when I say that the members of the medical profession have at least arrived at the conclusion that the teeth are a very important part of the human anatomy and that the diseases of the teeth make deep impressions upon the general vitality of the patient. You will all agree with me when I say that, 25 years ago or even less than that the average medical man in practice looked upon the teeth very much as he would look upon the appendix as in a case of appendicitis; if there was a diseased tooth it was a case for removal. Today the medical profession

is awakened to the fact that the teeth can be treated, and that diseases of the teeth can cause diseases of the body; thus, curing the bad conditions of the teeth induces normal conditions in the body.

In New York City it is said that over 50 per cent of the children are affected by diseases of the teeth. I would like to amend that statement and say that 96 per cent is more correct. That being true, think of the serious influence such a condition exerts among those children. I will say that no condition has been met in the field of pathology that has wrought such destruction to mankind, I mean destruction of the powers of man to achieve those things in life for which we all strive, lowering the vitality and rendering their activities ineffective. There is no influence so universal as this, I believe in lowering one's vitality, and I have given this subject a great deal of thought. If all of the physicians and all of the dentists were armed with the necessary instruments and directed to use them provided they knew how to do so properly in the matter of cleaning the teeth of the American people, they would never get it done. It is a timely move on the part of our friend here to bring this subject up now and he never in his life, and I know he has accomplished a great many things, undertook a more important mission than to present to physicians and dentists the great importance of the subject of prophylaxis.

I want to express my personal appreciation of Doctor Cazier's visit here tonight.

DR. C. N. JOHNSON:

It is very difficult to know where to begin on this subject. Doctor Cazier has brought something to us tonight, as I understand it, more in a suggestive way, than as a proven fact of practice. I believe it is a good suggestion. We all know that the condition of the gum tissue in so-called pyorrhea cases is one of a lowered vitality. As I understand Doctor Cazier's theory this congested blood is to be taken away and its place supplied by blood which will better nourish the parts and will bring the gums back to normal. Now, that appeals to me as a very important and practical scientific proposition. I should like to see this matter carried out in a clinical way with well tabulated data on it and see if we haven't thereby added one other idea to the many that have been advanced for the control and cure of pyorrhea. It is one of the things we

have been less able to combat than any other disease which has confronted us with the possible exception of erosion and I welcome any suggestion made by a medical man, a dentist or anybody that can throw anything in our way that will equip us better to meet these conditions and effect cures. If we could take away the congested material from the gum tissue by some such instrument as this it would give nature a chance to cure the trouble herself.

DR. H. H. SCHUHMANN :

Before responding to your request for discussion of the paper permit me to thank you Mr. Chairman and the gentlemen present for the courteous invitation extended me to be your guest this evening. I want to assure you that I appreciate the honor keenly. After listening to the paper and the extensive discussion by the gentlemen who have preceded me I hardly think that I shall be able to add much more of interest to you. The measure which Dr. Cazier offers us as a prophylactic procedure appeals to me very much. It is along the same lines as the ideas of Dr. J. E. Keefe, given to us before the Chicago Dental Society some years ago. You will probably remember that he at that time drew our attention to the value of artificially induced hyperemia by means of making a suction cup out of our impression trays. Soldering a pipe of german silver into an opening made in the front side of the cup, taking a wax impression in it and carving away the wax around the gingivae, then attaching a rubber tube to the pipe and with a strong syringe create a vacuum. Of course the instrument Dr. Cazier shows us tonight is vastly superior to the original crude method. As a prophylactic measure this instrument appeals to me very much, however as a curative measure by itself in a well developed case of alveolar osteomyelitis I hardly think that it could be expected to be curative. I do not for a moment doubt that the extraction of the semicoagulated blood and slimy mucus and perhaps pus about the teeth and gingivae to be displaced by healthy blood and the stimulating action of the hyperaemia induced would also in those cases be of benefit. I shall be glad to make a trial with the instrument to see how much it will facilitate the task. I was particularly impressed with the plea the Doctor made regarding the adoption of scientific measures along the with the timeworn mechanical technique which we have practiced for so long a time. It is indeed pleasing to see how the appetite of the dental profession

has in the past year appeared for scientific work and I hope the stimulus given in that direction will continue with us as the time has certainly arrived when scientific work is demanded from us, as well as clever mechanical means to overcome nature's deficiencies.

DR. J. E. HINKINS:

When the doctor started out I first thought he was going off on some new line on pathology and I began to think about that and then I got up in the air. I looked this over pretty closely but I cannot see where we will derive any great benefit from the cups except in a mechanical way. I was somewhat disappointed because of the essayist not telling us how to use this instrument and what treatment to give to get the best results. I think the instrument would have to be used with a great deal of care and discretion and that data ought to follow up the use of it in every case.

Now, what would be the action of that suction on the gums around the teeth? If you applied this powerful suction to the gums would it not do more harm in the same way the X-ray does? We know from past experience that the X-ray does more harm in many cases because of not being able to control the force of the current and many times the burn is harder to heal than the primary cause. The same thought struck me in regard to this instrument.

I would like to discuss this matter more but I don't feel competent to do so. I thank you.

DR. S. K. KNOWLES:

When I read the title of this subject I could not figure out what preventive therapeutics would mean, and to have the subject presented in as practical a way as we are having tonight appeals to me very much.

The thought occurred to me in regard to this instrument, with the matter of prophylaxis in mind, that there might be harm in it as people might neglect the brushing. Of course, it would go without saying that this instrument ought not be used until the accepted practice of scaling the teeth in regard to pyorrhea is done first and, as I understand the essayist, this is to be used in connection with or after that work has been done.

The personal care of the teeth is the important thing. I say to patients that they can come to me every seven days or every thirty days but that it is the personal effort made every twelve

hours that counts. It is human nature to throw the responsibility on the shoulders of the man who is taking care of their teeth for them. Many of these people will spend considerable time in having their finger nails taken care of and do not spend one half as much time on their mouth and teeth. If we have a simple little mechanical device that can be used in connection with the tooth brush and that will take the interest of these people, something that can be used independently of what the dentist has done, they will undoubtedly take better care of their teeth.

It was very interesting to me to see these little caps, there is a point in this connection I want to ask, that is, whether the drawing of the blood through the tissues would be great enough to start the formation of ulcers. I thought that was a point that might be considered.

DR. L. L. DAVIS:

I am not going to discuss the paper this evening and neither am I going to apologize for having brought this gentleman here. The title was suggested with the idea of bringing out a good attendance this evening and I think it has demonstrated the ability to do so.

I have used this instrument in my office, at that time Dr. Cazier made no claims for it except for the removal of the food and the foul material that might lodge around the teeth and in the pockets of the teeth. I feel that if we could get such an instrument introduced in the home and superintended in a way that there may be no injurious effect upon the tissues it may be a means of giving us a weapon with which to fight pyorrhea from another vantage point.

I certainly feel under great obligations to Doctor Cazier for his presentation this evening and I am under great obligations to the gentlemen present for coming and listening to something they knew not of.

DR. P. J. KESTER:

What appeals to me is that this seems to be a good application of the vacuum cleaner as applied to the teeth. I don't know but what that is a good thing at that. I take it that preventive therapy is that treatment of the teeth which puts them in that condition where the recurrence of decay is unlikely.

It seems to me that the instrument used as a treatment for

pyorrhea might stimulate them, producing a hyperemia that might prove helpful.

I wish to thank the gentleman, not so much for his exhibition of the machine, the apparatus or the instrument, whatever it is proper to call it, but I wish to thank him for the words he said regarding practicing dentistry as a profession. I endorse his statement that a large part of the medical and dental profession have been practicing commercialism rather than true professionalism. That was the best thing, as far as I am concerned, that he has said this evening.

DR. J. G. REID:

I have been thinking about this matter a little bit, not only tonight, but on previous nights. I am getting along to the period of dotage, but I want to say this, and I do it with the utmost respect that I have and feel for the gentleman who has come here tonight for our edification, that I think priority of the application of this principle can be ascribed to Doctor Keefe, so far as I know. He was the one who originally introduced this novel method of cleansing the diseased tissues around about the teeth. I believe that the apparatus presented to you tonight is a much more simple application of the principle for the prevention of diseases to the teeth.

Now, I have been afflicted with what they call osteomyelitis, although it has so many names that you can't help miss it. I am afflicted with it and I suppose that many of my hearers are troubled with the same disease. I have been fighting one or two places myself for the last five or six years. I have applied medicines enough to kill a horse and I have done all sorts of things; I have brushed them, I have massaged them and I have done everything that anybody would suggest to arrest that condition. I have subdued it, held it in subjection as many of us have done in pyorrhea cases. There are many pyorrhea cases that we do cure. Now, for the past year in this particular spot that I have been experimenting with on the central incisor, I have been scaling that place pretty thoroughly and I have been able, by this process, to maintain a more comfortable condition locally than by anything I have done heretofore.

Now, there are places that I know it is impossible to produce a vacuum in the mouth by the individuals themselves, but I can believe from my own experience, that if it was possible and they

could keep it up from day to day, that process of cleaning would be of more benefit to the patient than any other I know of. I believe that the principle is good. It not only is used as the gentleman has stated but it is for the purpose of stimulating the diseased tissue and bringing in a new vital fluid into the parts and taking the place of old diseased tissue that remains there and is injurious. If you can keep the parts full of healthy blood constantly you are not going to have any deposits of that nature around the roots of the teeth. Not only that, but pyorrhea starts purely and simply from an engorged gum tissue. That is the primary and initial lesion of pyorrhea and if you destroy that in its incipient stage you are going to destroy any future condition of pyorrhea. Now, as a substitute to a prophylactic care of the mouth it seems to me that this is not an improper thing to introduce. It will do the job; it will clean out food that can be gotten rid of in no other way. It seems to me, in addition to that vacuum process, if there was some means by which the tissue in the locality could be filled with a fluid of some kind as an additional cleanser it would be a good addition. I don't know whether that can be done but it seems to me such a thing might be devised in connection with it.

Of course, the star that will shine in the firmament of tissue treatment is the fellow that will find some microbe that he can put in there that will live on some of the diseased parts. That is not an improbable thing at all. If you can find some fellow that will do that we would all be in the heaven of joy. It sounds foolish to you, probably, I know it does to me, but there are many things that happen every day that sounded just as foolish before the accomplishment as that, and if such a thing could be done it would be a wonderful state of progress.

I saw this instrument at the clinic the other night and I was very much interested in it. I was not backward in saying to the gentleman that he was working along the lines of what I thought was right. I know he hesitated a little about saying anything about himself but he has been experimenting on himself for some time and if he has accomplished the things on himself he says he has he certainly has done something very wonderful. I have done the same thing in my very meagre way and I feel satisfied that he is right.

DR. GEO. W. COOK:

I was afraid Doctor Reid was not going to give me a chance

to make my speech and now I have forgotten it. First, I want to thank the essayist for his contribution tonight and also I want to thank the president for having everybody called on before it came my turn. They have all said what there is to say on the subject which leaves nothing for me.

I remember in my early writing, perhaps the first time I ever tried to write anything, I wrote a paper on some bugology regarding the gum tissue infecting the general system. I was then jumped on by a number of gentlemen who were present at the meeting and I remember the substance of the remarks that were made by Doctor Brophy that night. It is about sixteen years ago now when he said that the time would come, probably in the life of most of us there at that time, that we would begin to look to the mouth as a greater source of infection that we had ever dreamed of before. The discussion has continued along those lines more or less for a number of years and we are today looking to the mouth for the real incubating apparatus for some of the general infections of the body. Such a thing was not thought of at that time and is even now thought of by but a comparative few.

Some time ago I got a few rubber finger cups and cut off the tips of them and made a suction cup out of them, or rather produced a cup process for the gum tissue and followed that for a long time and watched the results that were obtained. In some few cases the results were amazingly surprising while in other cases I found the conditions were often worse than when I began my cup process. Then I rather balanced up the thing and said to myself it was just the same as when I began.

The object was, from a purely pathological standpoint, to bring in new blood to the tissues, if we can say it is new blood. We know many times that there are clumps of bacteria that get in through the walls of the small blood vessels not having connective tissue fibre sufficient to guard the increase of the micro-organic life that can live in the fluids. They insinuate themselves through the walls of these small vessels and they are sometimes a source of great irritation at that particular point. This apparatus helps to cleanse that part of this micro-organic life and also to produce an increased activity on the part of the leucocytes in that locality. I see a great benefit in something of that kind.

However, in treatment, there are stages where you would

possibly increase the difficulty that you are trying to get rid of. It is like everything else. You have to use it with a knowledge of what you are using it for at that particular time.

There has been a great deal said tonight but there are two of the most brilliant minds in this society here unheard from as yet; one of them is constantly taking notes and the other is constantly thinking of things pertinent to the subject, so I will close and allow them to unburden themselves.

DR. M. H. CAZIER (in closing):

I am very deeply sensible of the compliment extended to me and I appreciate very much the annotations which have been made to my feeble offering. It has been suggested that I have omitted accurate directions for use of the instrument in practice. You may well understand the reason why I wish to avoid that "cocksuredness" which would characterize the charlatan or the quack, should I undertake to instruct you gentlemen in anything pertaining to the work in which you are so far ahead of me in skill and knowledge, would make my remarks ludicrous if not entirely out of place. Therefore, I have purposely avoided, until you ask me, making any reference to the practical application of this device. I am doing so now with the understanding that it is tentatively suggested and not dogmatically offered for your acceptance.

I suggest the application of the instrument to each jaw for 3 to 5 minutes night and morning as a sanitary measure of great value, especially in mouths of children wherein infection is more liable and more hazardous. The same recommendation is made with your own modifications for patients receiving at your hands treatment for pyorrhea and that you direct its use and observe the effect. In your offices when you have explored the pockets and removed deposits, the application of this instrument will soothe by the gentle massage and the suction; the gums are gently pressed together and the tissues fed by a copious supply of blood.

Doctor Logan and some others have been kind enough to refer to some previous conversations we have had on this subject. My conversations with any of the gentlemen in their offices always have been brief because I felt like a trespasser on their time whenever they have been kind enough to receive me and hear a few words. However, I was absolutely unwilling to go forward with

any movement toward making this apparatus available at your hands until I should have submitted it, if you please, to some of the leaders in the profession. When I suggested this to Doctor Logan and to Doctor Davis I was fully impressed with the value of the stimulation of circulation although I mentioned it then no doubt in a very cursory and brief fashion. When Doctor Logan suggested this was the theory of Bier, and that he had written a book on Hyperemia, it opened to my mind to the fact that a scientific man of eminence had put forward, as Doctor Logan told me, in a very readable and instructive fashion, some of the things which I was feebly attempting to utter. I found some very helpful thoughts in some of the applications he has made of this principle. •

Adding the antiseptic fluid treatment to the machine, I think would introduce an element of danger. Asepticism is far better—the “vis medicative nature” seek to develop nature’s latent powers. See Bier’s diseases on the Germicidal action of Hyperemia.

Coming back to what Doctor Reid has suggested, if we could find some other germ that would thrive on the deposits and plant them, I am of the opinion that we would raise havoc by such a procedure. Now, if we would put that gentleman in there he would have to have a household and a family, think of the debris they would cause, the removal of their garbage, would still require our very careful attention and we would probably find the last stage of the patient worse than the first.

In the matter of the vacuum cleaner, I think it was in a dentist’s chair some two years since that I first conceived this idea, and the language I used to the dentist was the same that Doctor Kester had used this evening. I said that I was going to make a vacuum cleaner for the mouth. Having in mind what the secretary said just now I suggest that if he will submit himself to the operation of the instrument and set this little cup aside till tomorrow and examine it microscopically it will show what he had for dinner this evening.

Now, this occurred last week. A young man came to my house to see this machine. He came over, not thinking there was any trouble with his mouth, but he said he would just like to try it. He wanted to see what the physical result would be, how it would feel to have a cup over his teeth and gums and to let the pump work. When he had finished he said: “I thought I had

cleaned my teeth since dinner. I see something there that looks as if I hadn't."

Well, he remained for another half hour and then I told him he could take the vial along if he would and he took it to a microscopist who found pus. That enabled him to draw the attention of his dentist to the fact that he had a pus cavity in his lower jaw. The dentist had overlooked this. He might not have found it otherwise, but now his dentist must find the source of the pus and treat the case in the early stage.

Coming down to the subject of what it has done up to date, I will say it has so far convinced me that the question of any benefit to any diseased structure in the mouth is merely that of degree. I believe that anything with a tendency to remove the food particles from the pockets in the gums, a thing this instrument certainly does, I believe the degree of benefit which will result in any particular case is an equation which depends upon the constitution of the patient whether suffering a dyscrasia or in good general health. In my parlance this operation baptises the tissues with healthy blood.

These things that we theorize upon place us in the position of an architect, who first must dream or plan his buildings, reduce the plans to practical form and then to paper for the builders to work with. We also must first have rational theories, even though crude in the beginning, if they are supported by scientific facts, and if we keep on with an open mind and careful observation we are on the road to render to mankind the best services a man can perform in his profession.

I thank you, gentlemen, for your kind attention to my feeble efforts at elucidating the uses of this instrument and for your kindly suggestions and criticisms. I have had a very enjoyable evening and am at liberty to go into greater detail with any one interested.

CHICAGO DENTAL SOCIETY.

A regular meeting of the Chicago Dental Society was held on November 18, 1913, at 8 p. m., in the Northwestern University Building.

Dr. Geo. N. West, President of the Society, occupied the chair.

The first paper of the evening entitled "The Indications and Contraindications for Pulp Capping and Devitalization," was read by Dr. C. N. Johnson.

Dr. Gethro followed with a paper entitled "The Treatment of Root Canals in Clean Cases."

DISCUSSION.

DR. D. M. GALLIE:

Mr. President, I will not attempt to discuss both papers, but I shall try to discuss the first paper as I had the opportunity of reading that over hurriedly.

I want to compliment Dr. Johnson on the way in which he began his paper, protesting against the apparent indifference as to the value and usefulness of the pulp. He quoted the remark that "dead pulp tell no tales." I do not think too much emphasis can be put upon the importance of saving the pulp. When you stop to consider that the vitality of the tooth depends upon the pulp, and when you read the history of infection and the cases traceable to pulpless teeth, and then go back and follow the clinical history in your own office and realize the number of failures that come back to you, you can surely then recognize the importance of saving the dental pulp.

At the State meeting in Peoria, we had a distinguished member of the profession as the principal essayist, and I think those of you who were present remember that he made the statement that after the tooth was developed, the consideration of the pulp was of little importance. He was not present at the meeting of the National Association in Milwaukee when the clinic was held where samples of teeth were shown which had been sent all over the country to be filled. Hardly a single case out of hundreds exhibited showed a perfect root filling.

Some years ago, Dr. Hannaford sent out about a hundred teeth to skillful operators requesting them to cleanse and fill the canal according to the methods practiced in their office. There was only one man who sent a perfect root filling, and yet the root fillings were placed there by men considered leaders in the profession. If it is not possible to fill a canal where you can get right down into it, it would be still more difficult to do the work in a patient's mouth. When you stop and think of what Dr. Gilmer says that "twenty-five percent of all mouths have pulpless teeth,"

the chances are that an abscess is there. Does it not make every man feel that it is his duty to save the pulp of every tooth? There are conditions that make it absolutely impossible to avoid devitalizing, but when you resort to that treatment, do it according to the methods of the men who are making that a special study.

I do not believe generally in capping, but I would take a chance occasionally in the anterior teeth. When I first entered the profession twenty-two years ago, there was a great wave in favor of pulp capping. Dr. Graves here was a skillful operator, but he got it into his head that a pulp could always be saved by capping. Dr. Graves soon had an army of followers just as we have them today. It was not long before he and his associates were kept busy doing what they should have done in the first place. When it comes to the capping of pulps, there is a time when we should take every precaution possible, and that is when it comes to saving the pulp in the teeth of our little patients. Those little patients who come to us in the infirmary and the ones with the first molar gone almost beyond redemption, I believe in taking a chance with them because the pulps of those little folks are very resilient, so I take a chance to save the pulp in the first or second molar and the incisors.

In the school infirmary, it seems that our senior students have a mania for using arsenic so that they can cut in all directions. That makes me a little conservative. You and I knew long ago that if the tooth was devitalized or destroyed before there is complete formation, it is a thorn in the flesh. I believe in capping the pulp, Dr. Johnson, in that class of cases.

In regard to the means of devitalizing, Dr. Johnson speaks of two methods commonly used: Pressure anesthesia and arsenic. In my practice, I use pressure anesthesia in the single rooted teeth. I find in the anterior teeth it is not followed by so much soreness. In the molars, I prefer to use the arsenic paste. In order to protect the patient against discomfort, I have found a little disc that Dr. Currier had designed, to be very satisfactory. I have sealed in arsenic with gutta percha, but I prefer in the majority of cases the cements we have for that purpose. By first protecting the gum at the gingivae we can cover it over with a little cement that will safely keep it in. When I first got into the profession, many advocated saturating with thin pieces of paper in phenol and capping

them over the pulps. I have heard only lately of cases which I protected years ago by this means. I was reading an article the other day by Dr. Black in which he advocated the use of isinglass over cement. I have come to the conclusion, from my own experience and that of others, that this subject cannot be gone over too often. That is the weak point in our practice, and the foundation upon which all our operations are made.

DR. ARTHUR D. BLACK:

Mr. President, I wish first to emphasize what Dr. Johnson has said as to the consideration which should be given to the pulp. We ought to realize that whenever the pulp of the teeth is involved that the treatment of that pulp and the subsequent filling of the root canal is very much the most important thing that we have to do for that tooth and that patient. We may put in a poor filling or put on a poor crown, and we may do those over in years to come, but when we fail in pulp treatment, usually the extracting specialist is the only man that can do that over for us. I think we ought to consider the pulp very much more seriously than we do.

In discussing these two papers it is important that we should bear in mind, as has been suggested, the relationship of the conditions and technic, which have been mentioned, to the pathological conditions which are to be presented in subsequent papers. Aside from the question of preventing or relieving pain, there are two main objects which we should have in mind whenever the treatment of a pulp is undertaken; to preserve the tooth as a useful unit in the performance of its functions and to, at the same time, avoid injury to other parts, neighboring or remote. We recognize that failures in judgment or technic often result in alveolar abscess, that an abscess may exist for years without very seriously affecting the usefulness of the tooth, although it may at the same time cause serious involvement of other parts. The percentage of cases in which such results occur point out the absolute necessity of improvement in pulp management.

In the development of the chronic alveolar abscess there often occurs the detachment and destruction of the tissue normally attached to the root about the apical foramen. I think we may say that the original injury to this tissue usually occurs from one of three causes: first, infection, second, traumatic injury; third, medicinal injury. Any one or all three may occur in connection with

the destruction and removal of pulps which are vital and not infected when treatment is undertaken.

From my study of these cases, I am satisfied that a large percentage of chronic alveolar abscesses occur about the roots of teeth, the pulps of which were vital when treatment was undertaken. It is also my observation that more abscesses occur about roots having fairly large and comparatively straight canals, than about roots with very minute canals. I feel that we have been charging too many of our failures to the dead pulp and the tortuous small canal, when, as a matter of fact, they are due principally to lack of care in diagnosis or in technic, or to the misuse of drugs.

I would like to have had the first presentation of this subject of pulp treatment begin a little farther back than with the capping of pulps, because our first consideration of the pulp ought to be previous to the time of exposure. There is room for considerable discussion of the subject of preventive treatment. It goes without saying that if we could prevent irritation and inflammation of the pulp, there could be no alveolar abscess. We should, therefore, in our management of cases be ever on the alert to prevent inflammations of the pulp. The number of pulps which are removed in proportion to the number of the dentist's regular patients is a rather definite index of his ability in the general management of cases and patients.

To prevent pulp inflammations, we should first of all impress patients with the necessity of regular examinations of the mouth, the frequency of which will be determined for each individual; on the average, about every six months for adults and every three months for children. Our next duty comes in the making of more thorough examinations of the teeth, so that a larger percentage of cavities will be found before the pulp has been involved. This applies especially to the earlier discovery of proximal decays. I think proper examinations of the mouth will not become a matter of general routine practice until we shall have impressed their importance on our patients by devoting considerable necessary time to them, and charging a proper fee for the service.

We should be extremely careful in our cavity preparations to avoid both exposure or near approach to the pulp by not cutting deeper than is required by the decay, and we should be particularly careful to avoid the recession lines of the pulpal horns in

obtaining retention and resistance form. We should remember that, for each lobe of enamel, or for each cusp, there is a line extending towards the pulp chamber, which, in the formation of the dentin, is the last portion to be calcified, and that there may never be a complete closure of the dentin along such lines, but that the horns of the pulp may extend along these recessional lines almost to the dento-enamel junction. This is one very important reason why proximal cavities in bicusps and molars should be prepared with occlusal step anchorage, because such anchorage may be obtained with less danger of near approach to the pulpal horns than by buccal and lingual retention grooves in the proximal portion.

Thermal shock is not included in the subjects presented tonight, yet non-conductors should play an important part in the prevention of pulp inflammations. While we may not know how nearly the pulp is approached in a particular cavity, whenever cavities are deep or the teeth unusually sensitive and metal fillings are to be placed, there is no excuse for failure to place a non-conductor as a preventive measure. Particular attention is called to mesio-distocclusal cavities, in which the filling will be close to the pulp on three sides, thereby increasing the danger of thermal irritation.

I would also like to express my criticism of the use of stones, as advocated by many, in preparing cavities for inlays. The fact that the operation may be done without pain by the use of a stream of water, does not prevent irritation from the jarring of the tooth, which occasionally results in the subsequent death of the pulp. The same principle is involved in grinding the enamel from vital teeth for crowning. This may often be done without pain, but the pulp usually dies, not from thermal shock, nor from pain, but from the irritation to the vessels of the pulp by the grinding.

To return to three principal causes of the development of chronic alveolar abscess in connection with the treatment of vital pulps, such cases occur from errors in judgment or in diagnosis, as a result of which the pulp dies, becomes infected and the infection involves the peridental tissues. They occur from errors in technic, either in the proper removal of the pulp, or failure to properly fill root canals, or from failure to carry out the strictest possible asepsis. There is entirely too large an element of carelessness in this work; this carelessness seems to be inborn in some,

but doubtless is developed in many as a result of being in too much of a hurry, coupled with the knowledge that the fee to be charged is small. I believe most of us know better technic than we employ and I am inclined to the belief that men will take the necessary time to do this service the best they know how when they develop enough stiffness of backbone to charge a proper fee for the service. The two must go together; impress the patient with the importance of service by taking time enough and pains enough to do it the best you can, and then further impress him by charging an adequate fee. If he is properly impressed by the service, he will be less apt to object to the fee. The misuse of drugs must account for many chronic abscesses. In placing any medication in a root canal, it should always be kept in mind that some of it may pass through the apical foramen and come in contact with the periapical tissues. I think, therefore, that it should be a general rule governing the placing of all treatments in root canals, regardless of the condition of the pulp or canal, that no drug should be used which could not with safety be applied directly to the soft tissues. I call attention to this danger in the larger canals especially, and there is room for inquiry as to whether or not a considerable percentage of the chronic abscesses which are observed about the roots having large canals, which can be and often are well filled, are not due to the destruction of the periapical tissues by drugs placed in the root canals.

I would like to emphasize what Dr. Johnson has said regarding the indications for capping; that there is the greatest likelihood of success when a pulp is exposed during what Dr. G. V. Black has termed "the childhood period of the permanent teeth," the period during which they are being developed and covering the period to the completion of the root of each tooth. Most pulps die from strangulation of the vessels at the apical foramen, and strangulation can hardly occur while the root end is wide open.

Dr. Johnson has given us a statement of the years at which calcification of roots may be complete, and has mentioned, not the average age, but almost the earliest age at which the root may be fully formed. I wish to impress the fact that for many teeth the roots would not be completed until three or four years later. In the particular case, the X-ray may be employed to determine the condition of the root.

Dr. Gethro's paper has given us a brief but interesting historical sketch of the development of root canal treatment. If every operator would follow the modern technic which he has presented, the number of failures would be greatly lessened.

I must take issue with Dr. Gallie on the question of leaving carious dentin in a cavity for fear of exposing the pulp. We can never know, until the carious dentin has been removed, whether it has reached the pulp or not, but we can count almost certainly that it will progress and eventually expose the pulp if we do leave it, whereas a pulp that has already been exposed by caries is almost certain to die from the toxins absorbed. Therefore, I feel that we are not doing the best service if we leave carious dentin in a cavity, because, if we do, the pulp is almost sure to be lost, either because it is already involved, or will be by the extension of the decay. On the other hand, if all of the carious dentin is removed, we will often find that it has not yet reached the pulp and the pulp may be saved by placing a non-conductor; and in those cases in which the roots are not yet fully formed, and the pulp has been involved by caries, there is, I believe, a better chance to save the pulp by exposing and capping it, than by leaving the carious dentin to continuously irritate the adjoining pulp tissue. In my practice, I have never intentionally left carious dentin in a cavity.

DR. EDGAR D. COOLIDGE:

Mr. President, We have just listened to two splendid papers and two fine discussions. The last discussion contained many points of vital interest to us. I enjoyed Dr. Johnson's paper immensely. He was my teacher in school, and he will always be my teacher.

I have chosen to discuss Dr. Gethro's paper. There was one point Dr. Gethro made wherein I disagree with him, and that is, as to the wording of the subject. I believe that root canal fillings should be included under the title of root canal treatment.

The success or failure of this work depends upon the care taken in its details. It takes time to do this and the remuneration must be in proportion to the time spent. We cannot get away from the fact that the time spent is important, and we must be remunerated for it. If Dr. Gethro's paper had been on the subject of how to fill root canals in ten minutes, probably it would have been received with more interest because we all wish to know how to handle these cases properly in a shorter time. The time

that we spend in treating a tooth and filling root canals, may be time that we begrudge because we feel that we are not remunerated properly for it. We have at least two or three sittings in these cases and the common practice has been to charge a definite amount for the entire treatment instead of a proper amount for each individual treatment. If the dentist considers the importance of this work, he will have taken the first step toward a good root filling. Nothing requires too much time to be done well. No patient would want it otherwise. A patient will appreciate time spent conscientiously. Every man enjoys doing some one line of work more than any other, and if he will look over his books, he will see that he is better paid for that work because he enjoys it; he talks it and his patients pay him for it. If we realize that root canal filling is the foundation of all of our work, then we will believe in it and if we have to spend more than three sittings on a root canal we will do it willingly and the patient will appreciate it. It is not possible to have a set price for the root canal filling, and until we get away from that fact, we will never have the best results. The remuneration should never be considered as most important, however I believe when the thought of the operator is not hampered by the fear of the loss, it will eliminate a great deal of the subsequent trouble we have with infected areas around roots that have been filled.

In regard to the broaches, I would like to commend part of what Dr. Gethro said and to disagree with him on the remainder. The smooth broach roughened with the file is the best means of opening the canal. I cannot agree with him as to putting the barbed broach in the canal to open it. I would prefer the above mentioned or the spiral broach. Dr. Black said that the large canals would give more trouble than the small ones. I would like also to emphasize what Dr. Black said in regard to the preventive methods.

Dr. Gethro did not mention mummifying in the historical review. Probably that comes under the head of pulp treatment rather than canal treatment. That created a great deal of interest a few years ago, and such men as Wetzel, Miller and Harlan wrote articles on it.

Paraffin was mentioned as a root canal filling. That was introduced by Chas. S. Tomes in England in 1883. This has been

experimented with to some considerable extent. In the minds of many scientific men it is considered of equal value if not surpassing gutta percha. Paraffin is received kindly by the tissue and if any goes through the apical foramen of the tooth, it will not cause irritation and subsequent trouble. In cases of accidental perforation, it is claimed that it can be used to fill the canal with assurance of a good result.

I agree with Dr. Gethro in regard to the technique of the work. The method is ideal. No doubt a great many root canals can be filled that way, and filled perfectly, but I fail to see how he would always know when the canal is filled to the apex. It seems to me it would be less uncertain if he had some liquid preparation to place in the canal before inserting the gutta percha cones so that he might be more assured that he had filled the canal to the apex. I prefer the preparation called Eucapercha compound for this work because it is easily made to flow into the canals and will remain in a liquid condition long enough to complete the operation which chlora-percha will not always do. Another good feature of Eucapercha compound is that it contains not only eucalyptol but also menthol and thymol. The gutta percha cones should be washed in alcohol before placing them in the canal. This not only cleans them but the evaporation chills them and makes them more firm and more easily handled. Although gutta percha has been used for over fifty years for root filling, I do not believe we have yet found the right material for root canal filling. I believe something else will develop that will be more satisfactory than gutta percha for this purpose.

I do not believe every operator fully realizes the importance of asepsis in this work. When we stop to think that the rubber dam has been one of the things that has made it possible for dentistry to advance, and is not yet used by all of the profession for this kind of work, we are face to face with one of the hindrances to continued progress because we are not using the means we have for making our operations as aseptic as possible. It has been said that we can not have an aseptic operation in dentistry, but we can come closer to it than many do, if we take pains. I understand that Dr. Billings and other physicians of this city have cases that are due to infections about teeth which have been improperly treated, or not treated at all. In some cases it has been

found that after the tooth has been carefully filled there is a branch of the main canal with a separate foramen which was not discovered. There are some teeth in which it is impossible to find those things, but this very fact is the best argument for greater care in this work.

DR. C. KABELL:

Mr. President, I have never heard a discussion of the different varieties of gutta percha. I have seen teeth where they used gutta percha cones where it was pushed right through the apex. The gutta percha was too hard. I take crystals of thymoline and melt it in the pulp cavity with the hot air syringe. This makes a volatile liquid which dissolves the gutta percha, and I fill the canal to the end. It will crystallize again in the tooth and form a filling which fills the whole root canal. I also have used crystals of thymoline when I exposed the pulp. They will adhere to the walls of the tooth and form a seal over the exposed pulp.

DR. JOHNSON (closing the discussion):

Mr. President, I want to refer for a moment by way of emphasis to something Dr. Black has said in regard to the attitude of the medical profession to the work we are doing in our offices. I think the time has come for our profession to hold up its head and claim the proper respect of the medical profession. We are not doing that unless we correct the medical profession in its attitude towards crown and bridge work, because they are condemning crowns and bridges in the mouths of our patients. Certain medical men, when they see a crown upon the root of a tooth, tell the patient to go and have that crown removed. I believe the medical profession is doing incalculable harm when they give that kind of advice. I believe there is a great deal of crown and bridge work that does more harm than good, but there are many crowns today that have done service for years and are not doing any harm. The medical profession is making the mistake of judging all cases by a few and they are making the mistake of passing judgment after a superficial investigation. I would welcome very cordially the medical profession to discuss these things with us at our meetings. They make no distinction between a crown that is properly applied and a crown that is slapped on without any attention to asepsis. I admit that our profession should be censured for the way that some of the work has been done, but

it is a serious injustice for the medical profession to implant in the minds of the public the impression that our crown work is all bad, and I believe our profession should rise up and correct that impression.

DR. GETHRO (closing the discussion):

Mr. President, I really have nothing to say in closing the discussion. I did mention paraffine, however, as one of the root fillings. I wish Dr. Johnson had told the story that we heard the other day. During the recent convention many medical men were in the audience and the attention of a surgeon was brought to the crown on a tooth. He said that every crowned tooth was the work of the devil. I believe there was applause from the audience. This shows the thought of the medical men at the present time on this subject.

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EDITORIAL.

NATIONAL CONFERENCE ON RACE BETTERMENT.

At Battle Creek, Michigan, on January 8, 9, 10, 11, 12, 1914, there was held a meeting under the auspices of the National Conference on Race Betterment, which was a very noteworthy event. The list of speakers embraced some of the most eminent scientists and foremost thinkers on race problems in America. A few of the names may be mentioned as illustrative: Rev. Newell Dwight Hillis of Brooklyn, Hon. Ben B. Lindsey, Judge of the Denver Juvenile Court; Dr. Victor C. Vaughan of Ann Arbor, Mich., president-elect American Medical Association, president Michigan State Board of Health; Dr. J. M. Hurty, commissioner of health State of Indiana; Hon. Woodbridge N. Ferris, Governor of Michigan; Hon. Jacob A. Riis, New York; Dr. W. A. Evans, Chicago; the Very Reverend Walter T. Sumner, Chicago; Dr. J. H. Kellogg, Battle Creek Sanitarium; Prof. Irving Fisher, Yale University, etc., etc.

Some of the subjects considered were as follows: "The Effect of Alcohol on Longevity," "Alcohol—What Shall We Do About It?" "The National Department of Health," "Deterioration of Civilized Woman," "Function of Individual, City, State and Nation, in Bringing About Race Betterment," "The Relation of Physical Education to Race Betterment," "Eugenics and Its Founder," "Factory Degeneration," "The Cost of High Living as a Factor in Race Degeneracy and Limitation of Families," "A

New Race," "Public Repression of the Social Evil," "Education for Parenthood," "The Delinquent Child," etc., etc.

It will be seen by these random selections from the program that the subjects were varied and most significant in their bearing on race betterment. It is seldom that such a live body of keen thinkers ever come together at one meeting, and the interest shown throughout the conference was intense.

But for dentists, the most significant thing connected with it was the fact that one of the numbers on the program was "The Function of the Dentist in Race Betterment." We believe that this is the first time that such a body has recognized the profession in this particular way, and the credit for this is largely due to the dentists of Battle Creek, through whose influence the subject was placed on the program. After the lecture the moving picture film, "Toothache," was shown, and it is safe to say that the interest in oral hygiene received an added impetus as the result of this occasion.

The proceedings of the conference are to be published in book form and sold for \$1.00. Those interested in these important subjects may obtain a copy by addressing the secretary, Miss Emily F. Robbins, National Conference on Race Betterment, Battle Creek, Michigan.

THE GOLDEN ANNIVERSARY OF THE ILLINOIS STATE DENTAL SOCIETY.

In our October, 1913, issue we made announcement of the coming meeting to celebrate the fiftieth anniversary of the Illinois State Dental Society in Chicago. The date has been fixed for March 23, 24, 25, 26, 1914; and everything points to a record attendance.

To quote from the official Bulletin of the society:

"International Day, Monday, March 23—Every large dental society in Canada, every State in the Union and many foreign countries will have representatives present to clinic.

"Illinois Day, Tuesday, March 24—About two hundred members of the Illinois State Dental Society will give demonstrations along such original plans that all the spectator will be

compelled to do if he desires to see every clinic, is to take a seat at one of the fifteen to twenty-five round tables to be found in each of the ten or fifteen clinic rooms, which are large enough to accommodate one hundred and fifty to two hundred and fifty in groups of ten or twelve. The only way one can miss a personal demonstration at each table will be to leave the room for a few minutes during the progress of the clinic.

"Chicago Day, Wednesday, March 25—Eighty to one hundred and fifty of Chicago's most competent dentists will clinic in their offices, and it will be so arranged that all who wish to see these distinguished men working in their home environments, can do so in comfort in groups of eight or ten, and said groups may break up every thirty minutes and go to the various offices.

"Banquet, Wednesday evening—The banquet will be held at the hotel, and all members, guests and ladies are cordially invited."

In addition to the clinical program there will be a very entertaining literary program to be led by such men as Drs. E. T. Darby of Philadelphia, A. W. Thornton of Canada, and E. K. Blair and Edmund Noyes of Illinois.

Chicago in its capacity as host extends a cordial invitation to the profession to attend this meeting. We want men from every State in the Union and a big delegation from Canada. We can entertain as many as may come, no matter how large the number, and the more that come the happier we will be. When this meeting is over we wish it to be truly said that it was the most profitable one ever held, and we verily believe this will be the case. Plan ahead and arrange now to be in Chicago in March.

THE EDITOR'S DESK.

A TRIP TO THE SOUTH SEA ISLANDS.

ANOTHER VACATION STORY.

(Continued from the January issue.)

TAHITI CONTINUED.

There is a favorite drive running out of Papeete along the ocean shore for some distance and then up over a mountain and down to the lighthouse. It is nine or ten miles from town, and at the lighthouse is located a monument to Captain James Cook to

mark the spot where, in 1796, he observed the transit of Venus. The place is called Point Venus, and the journey there is most interesting. About half way is a narrow drive leading from the main road to a somewhat desolate looking spot where is located the tomb of King Pomare, the last native king of the older regime, who died some time in the 80's. I had hired a convey-



Monument to Captain Cook at Point Venus, Tahiti.

ance of the French liveryman, and he sent us for a driver a native boy who could roll and smoke cigarettes more gracefully than I could speak English. But we had a heap of fun with that boy, and I learned something about native horsemanship. He was driving a team of ponies, and he drove most of the time like mad. When we came to the foot of the mountain he started them at a terrific pace, as fast as they could run. My girls protested and urged me for humanity's sake to make him drive more slowly. I said that the boy probably knew the ponies better than I did, and that I would not interfere. The wisdom of my decision was apparent in a moment. The team stopped, and then we learned that one of them was balky, and that the only way he would go

at all was to go with all his might. We got out of the carriage, and the boy dragged the team by degrees up the hill, while we walked and made humorous remarks about the situation. It is better to joke than to swear under such circumstances, and we managed to extract considerable fun from the affair. Finally we came to a level place, and the boy nodded for us to get in. I saw a sharp rise ahead and knew it would be a hard pull to take us all up on the run, so I told the Mater to get in the carriage, while the Indian Girl, the Collector and I walked on ahead. Just as we were about half way up we heard a clatter behind, and away went the outfit past us, the ponies running like mad, the boy slashing the whip right and left, the carriage swaying back and forth, and the Mater hanging on for dear life. We three pedestrians had such an uncontrollable fit of laughter at the spectacle that it threatened to lay us up on the roadside; but it was a grim performance to the ponies. At the top they waited for us and we started on the descent toward the lighthouse. When I saw the interminable length down grade I had some apprehension about getting that pony up the mountain again for the return trip, and so we stopped at the lighthouse and Cook's monument only long enough to take some snap shots and let the ponies rest. On the way back the inevitable happened—the pony balked the moment we approached the ascent, so we all got out and walked every step to the top. It was a hot tropical morning and the sun was terrific, but we had fortunately brought umbrellas, and really enjoyed the walk up among some of the most wonderful tropical scenery that can be imagined. All was so new to us and so beautiful that we were entertained every moment. By dint of hard work and much manouvering, the boy got the team to the top, and then the drive down the other side of that mountain I shall never forget. There was no brake on the carriage, and the ponies started down that long descent at full speed. They were now only too willing to go, and our experience soon became exciting. It looked terribly dangerous before many minutes, but I soon sized up the ponies and saw that they were very sure-footed, and so I began to smile. The native boy would look around every few minutes and grin in sheer delight to think he had the better of the team, and that we were enjoying the situation as much as he was. I have sometimes ridden fast enough in an au-

tomobile to make everything vibrate, and I have descended some of the biggest mountains in British Columbia behind a team when I thought the wagon would tip over forward on the horses; but I never before experienced anything quite so thrilling as this ride down that mountain in Tahiti, and, when we finally swung around a curve at the foot and came out on the level, I confess



A Typical Scene in Tahiti.

to a sigh of relief. In the midst of all the exhilaration I could not help wondering what would happen if a wheel flew off, or something broke. But we were in the middle of the fray before we realized it and were obliged to take our medicine.

As we drove along that day we were kept in constant wonderment at the luxuriant tropical growth on all sides. Immense cocoanut palms waving overhead, bananas with leaves almost as large as an elephant's ear and a great deal longer; bread fruit, mangoes, passion fruit, aligator pears, and many varieties with which we were not familiar. It was all most wonderful. But very few of the places were decently cultivated, and it seems a pity that where nature has done so much humanity has done so little. The only man I saw working was a native making a dug-out canoe from a log. He had it hauled up in the shade under an arch of boughs, and the fellow was about as naked as the log

he was hewing. Another man must have been trying to work, because we passed a school house with the doors and windows wide open, and heard the characteristic droning of the children, who were lazily trying to get their lessons. I jumped out of the carriage to get a snapshot of the building, when a native woman saw me and yelled something at the school teacher. He



Snapshot of a Native Tahitian by the Roadside.

rushed out, and I did not know whether he was going to stone me or hand me over to the police. But instead of that he jabbered something to the pupils, and several of them came out and lined up beside him in front of the school house to have their pictures taken. After I had made the snap I bowed and waved my hand in thanks. He smiled in great glee and made a profound bow, and took his pupils back to their work. Any people who will consent to have their photographs taken for a tourist can have my vote; I like them. As I was taking the snapshot my Indian Girl managed to make the driver understand that we wanted a cocoanut. He jumped from the carriage over into a plantation and got five from a tree, till we stopped him. I hand-

ed him a shilling, but the owner of the plantation came up just then and the boy, after parleying with him for a while, turned the shilling over to him, so I had to give the driver another. I think if we had not stopped the boy he would have filled the carriage for us. He seemed anxious to do all he could for us after we helped him up the mountain with his team.

We saw many native huts on this drive, and, of course, saw into them—the doors and windows invariably being open. We never saw a native sitting on a chair either indoors or out. They were invariably squatted on the floor, it seemingly being too much of an effort to be bothered with such a useless thing as a chair.

In Papeete we noticed along the streets many holes in the earth which we first thought were made by rats, but we were informed that the culprits were land crabs, which are a great pest on the island. We saw many of the cocoanut trees wound around with a metal band part way up to keep the crabs from crawling up and injuring the fruit. They are in the habit of biting into a nut in such a way as to lead to its decay, which is really worse than if they consumed the nut itself.

I could write much more about Tahiti, because the subject seems almost inexhaustible; but I remind myself that these articles are already too long, and must be curtailed. This was the last of the South Sea Islands I saw, and I cannot resist the impulse to compare the different Pacific islands in a very brief way. I heard one gentleman on board ship remark that if you saw one of these islands you saw them all, but this only proves that some very estimable people go through the world without seeing the significant things which are placed before their eyes. Each island has its distinguishing characteristic, and each is interesting in a different way. This is not only true of the native population but of the governmental control. I have written at some length of the native traits, and so need not repeat except to remark that I thank the fortunate chance which made it possible for me to study these people at first hand before the influence of white domination has completely obliterated the most significant characteristics of the native tribes. In all my future experience, however varied at may chance to be, I never expect to witness in the space of three or four months so much that is typical of native



Tahitians in Primitive Costume.

life as it existed in primitive times, and my only regret in writing these articles is that I have been unable to convey to my readers a sufficiently vivid picture of the things I have seen, a defect which might have been remedied in some measure had I not so frequently been prevented for lack of space from going into details. If I had realized at the beginning how interesting my trip was to be I should have gone more seriously at the task of writing it up, and should have presented a more systematic and coherent story, but to be perfectly frank with my readers, it was too often the case that I abandoned myself to a thorough enjoyment of the scenes about me, instead of making adequate notes for publication.

The Sandwich Islands, as we all know, are controlled by the United States, Fiji by England, Samoa by Germany, Cook Islands by New Zealand, and the Society Islands by France. I am making no invidious comparison when I state that the national characteristics of each government are being stamped on the native life, and this is plainly evident even to a casual visitor. To one outside, it would seem as if France had very little need of Tahiti, and was not giving it the close attention which so beautiful and productive an island should merit. She is not increasing in population at home in a way to demand a colonial outlet for her people; in fact, she is decreasing, and I fear that the best traditions of France are not being advanced in Tahiti today. I do not in any way wish to seem prejudiced, and I confess to ignorance concerning the diplomatic reasons and national motives behind the transaction; but I cannot help feeling that it was unfortunate when, in 1842, England turned Tahiti over to France. I take it that there must have been some good and sufficient reason, because the statesmen responsible for the transaction were assuredly more capable of judging the matter at that time than I am now, and yet even from the point of view of France herself I cannot see where she gets any material revenue from Tahiti. The people who are making money in Tahiti today are not the French people as a mass, but the Chinese as a mass, and let it be shouted from the house tops that the practical Chink is not going to spend his money in "La Belle France." But I must not venture far afield into political or sociologic topics, to which, after all, my opinion is entitled to very small respect. I

wish merely to touch lightly on the leading characteristics of the different places as I saw them in passing through.

Hawaii is motley in population, mellow in physical and temperamental characteristics, modern in its tendencies and delightful in every way. Fiji is more nearly barbaric, with little of the mellowness of Hawaii, more wild, primitive and untamed, but interesting always. Rarotonga is less picturesque than these, except for the abrupt mountains, which rise from the very edge of the town and which were covered with haze and mist all the time we were there. It is smaller in every way, quieter, more subdued, less cosmopolitan and with the softer graces conspicuously predominant. Tahiti has taken on more of the vices of civilization—if one may employ such a phrase—with less of an appeal to the principles of law and order which are supposed to be ushered in with the advent of any European control. It has more of what is called the “free and easy” life than any other island we visited, both in the temperament and habits of the people, and in the bounty of nature with which it is endowed.

As for the peoples we saw aside from the inhabitants of these various islands, I, of course, single out the Maoris as by far the most important and have already dealt with them in some detail. I saw less of the native blacks of Australia than any other race, my observation at first hand being practically limited to our trip on the Maroochy River, in Queensland, where we saw their huts and noted something of their mode of life. I was told on this trip by a representative of the Government Tourist Bureau that they are considered as among the most primitive, or, as he said, “the lowest” of all the native races in this part of the world. And yet this same aboriginal chap could construct and throw a boomerang to beat any other man, I imagine, who ever lived, and I have a couple of native spear heads given me by Mr. Pincott of Melbourne which show a marvelous adeptness in fashioning this effective weapon.

All natives are interesting in their way and all are distinctive, but if I were to cite two races who seemed to have similar traits it would be the Hawaiians and the Samoans. The latter, as I have already said, we saw in one of their native dances at Fiji, and in contrast with the Fijians they were in every way more attractive. They demonstrated the softer graces as do the

Hawaiians, were not so black as the Fijians, and I can imagine were never so warlike. They seem to run to the more peaceful pursuits of life, and in their homes they must exhibit more of the domestic tendency than most native races.

On the whole, I saw no native race which was in any way repulsive to me, though I, of course, saw habits which would not commend themselves to a cultured civilization. But one of the most striking things was this: in all my journeyings, along country roads and among native huts, through streets which were lined with people, and past the most primitive habitation than man can imagine, I saw no evidence of the biting poverty we sometimes see in civilized lands, and, what is even more significant, not in a single instance did I witness or hear of an individual reaching out the hand for alms. What a striking contrast this to the pitiable and even appalling spectacle presented by the beggar hordes of Europe, Asia and Africa, where mendicancy is a fine art as well as a continental disgrace. Questionable as the native South Sea Islander may seem in some of his practices, he has not yet descended quite so low in the scale of self-respect and intuitive independence as have countless thousands of those living in lands that are accounted civilized. There is nothing to my mind more demoralizing to an individual or a nation than cultivated and deliberate mendicancy and, measured by this standard, the native of the Southern Seas need not hang his head. I shall defend him with all my energy, and shall willingly condone his other offences because of this one magnificent manifestation of his inherent manhood.

C. N. J.

(To be continued.)

CORRESPONDENCE.

"LITERARY PIRACY."

To the Editor of THE DENTAL REVIEW:

Dear Sir—This is the only term that adequately describes the wording of Dr. F. A. Newhoff's (of Belleville) clinic on "Filling Root Canals with the Improved Compound Formula, That of Dr. Herman Prinz," as published on page 1306 of the December, 1913, issue of the DENTAL REVIEW. This clinician describes an instrument for inserting Prinz's paraffin compound

which any unbiased reader must recognize as the one suggested by me on page 342 of the March, 1913, issue of *Dental Cosmos*, under the heading, "A Home-Made Instrument for Inserting Prinz's Paraffin Compound in Root-Canal Fillings." No credit is given by your clinician, thus making it appear as if Dr. Newhoff were the originator of this instrument.

While this is a very small matter, and Dr. Newhoff has every right to make and use this instrument, I cannot refrain from pointing out this instance of appropriation of a borrowed idea, because it seems to be symptomatic of a distorted ethical attitude. In all scientific literature, it is an iron law that credit be given where credit is due, and citation be made where no originality can be claimed, and dental science surely is subject to the same law, an immutably strict observation of which would prevent many legal litigations, professional animosities so detrimental to true progress, and minor and major infractions of the eighth commandment in and out of professional pursuits.

Very truly yours,

RICHARD H. RIETHMÜLLER,
Ph. D., Univ. Pa., D. D. S.

Philadelphia, Dec. 27, 1913.

To the Editor of THE DENTAL REVIEW:

My Dear Sir—My attention has been called to an article in the January number of *THE DENTAL REVIEW* (Vol. XXVIII, No. 1, January, 1914, pages 8 to 23), entitled "The Mouth in the Etiology and Symptomatology of General Systemic Disturbances," by Robert H. Ivy, M. D., D. D. S., in which the author has attributed to me views I have never expressed. Will you kindly permit me to cite briefly his errors, and give the same prominence to this letter as that given to Dr. Ivy's article?

He says (page 18 of his article): "Attempts have been made by Zinsser (10), Stein (7) and others to prove that practically all hypoplastic defects of the teeth are due to inherited syphilis; these being ascribed by most observers to rickets, scarlet fever, measles and other eruptive fevers common in early life."

In my article entitled "Syphilitic Hypoplasia of the Teeth" in *The Dental Cosmos* (Vol. LV, No. 1, July, 1913, on page 691), I said: "Some forms of hypoplasia of the teeth are certainly

syphilitic, others may be attributed to syphilis, and others are certainly not caused by syphilis. Non-syphilitic hypoplasia of the teeth has been observed in the bull and the dog as well as in man." A reading of my entire article is necessary, perhaps, to show that I was writing, as the title indicated, on "Syphilitic Hypoplasia of the Teeth," not all hypoplasia.

Again, Dr. Ivy writes: "Stein advances as his reason for ascribing dental hypoplasia to syphilis alone the point that the calcification of the tooth is complete *before birth*." (Italics mine.) On the contrary, I said (page 693): "The time of the inception of calcification of the teeth as given by Pierce is not altogether correct.

Dentinification, however, takes place much earlier than is generally supposed. According to Magitot and Legros, the dentin caps of the teeth begin to form approximately as follows:

Deciduous Teeth—Incisors and canines: Sixteenth to seventeenth week of intra-uterine life. First and second molars, seventeenth to eighteenth week.

Permanent Teeth—First molars: Sixth month of intra-uterine life. Incisors, first month after birth. Canines, third to fourth month. Bicuspid, sixth month. Second molars, third year. Third molars, twelfth year, and that my statement might be understood by the least intelligent, I inserted a chart (Figure 4 in my article) illustrating that calcification of the permanent teeth begins (with the exception of the first molars) after birth.

In spite of this statement and the chart, Dr. Ivy says, "But he (Stein) apparently loses sight of the fact that, while the dentin may be fully calcified before birth," etc. "Loses sight of the fact?" Is it a fact? If so, I have not lost sight of it; it has never come within my vision.

Dr. Ivy says (page 19 of his article): "I have recently obtained negative Wassermann reactions in three cases, showing hypoplasia of the incisors and early central decay of the first permanent molars exactly corresponding to the cases described by Zinsser and Stein as syphilitic, who gave no history or had other signs of the disease."

I have seen many similar forms of hypoplasia of the incisors and first molars, the patient showing negative Wassermann reactions where the diagnosis of possible syphilis was later partly

confirmed by a labored extraction from reluctantly confessing parents of the truth of the sometime syphilitic condition of one or both of them, or more strongly confirmed by the examination made by the aurist or ophthalmologist.

Very truly yours,

JOHN BETHUNE STEIN.

January 10, 1914.

Arnhem, Holland.

To the Editor of THE DENTAL REVIEW:

Sir—the addition Dr. Walker gave to what I described in my letter on the combined use of cast gold and silicate cement brings me to a more detailed comparison about the filling materials, suitable for the restoration of larger defects in anterior teeth. As a rule, we may take it for granted that the best way for a permanent closing of smaller cavities is the malleted gold foil filling method. Porcelain inlays and silicate cements are very useful additions to the list of filling materials, but they can not substitute gold foil in every case. It is often said, and we feel it any time we have to select our material, each of them possesses its own usefulness. Our experience is there to help us in the judgment of which one to take, so that the best service is rendered to both patient and operator. We all know it is impossible to fill every proximate cavity with gold foil; we all would—if we tried—find it impracticable to get a permanent result with silicate cement in every cavity at this location we meet. Conditions, as extension labially and buccally of the cavity and dissolving capacity of the mouth fluids will often be found, after some time following the insertion, to be unfavorable for silicate cements. What we took for ideal in matching the shade of the neighboring enamel and easiness of insertion without strain on the patient and facility in contouring to the natural form, will vanish when afterwards the contact point proves to be flattened and the proximal convexity is disappeared. The line from the incisal corner to cervical gum margin becomes more and more straight, and from the interproximal space the interdental papilla slowly but surely creeps away with an obvious show of stasis. There certainly are cavities where silicate cement helps us out in a wonderful way, and I do not disagree with Dr. L. E. Custer, as he

states in his paper, read before the St. Louis Dental Society, Sept. 12, 1912: "The indications for a silicate filling I have classed in their order as to practicability. First, the proximal cavities of the anterior teeth which do not come to the incisal edge, the labial and cervical cavities of these teeth; in fact, all the cavities of the anterior teeth which do not come to the incisal edges; the cervical cavities of the bicuspid and the crown cavities of children's teeth." But let him exclude those proximal cavities where the extension labially and buccally reaches over one-fourth of the breadth of the front and back surfaces, and where the cavity is as high as the distance from contact point to cervical margin. Now I come to the consideration of what to take for restoring larger cavities in incisors where the incisal edge is gone. Walker condemns an all-porcelain filling in these compound cavities; his experience showed that porcelain did not possess the resistance against stress, which cast gold certainly has. Let me add to this, that the porcelain inlay must rely on retention only of the adhering of cement to a right-angled cavity; large gold inlays can be kept to place by means of a strong post, a complimentary resistance power, which cannot be added to a porcelain inlay without weakening it to a large extent. If we look sharply for beginning or threatening decay at the gingival angles of the cavity, we can feel sure in the expectance of a good permanent result by this combination inlay and filling method.

Esthetic reasons lead most of us to the condemnation of showing too much gold in opening the lips, and that is why an invisible part of our filling completes its usefulness. As I said in my description; after the inlay is put into place only a labial cavity is left to fill. To do the best we can, a material must be selected matching the shade of the other front teeth. Here I prefer silicate cement as a rule over porcelain, and I feel stronger in this opinion after receipt of a letter from one of the leading specialists in operative dentistry, stating he was sure silicate cement would prove to be a better material in these cavities than low fusing porcelain. This is not only true for the low fusing, but just as well for any porcelain body. There are three advantages of silicate cement for this purpose: First, on account of the undercut margins, which are, without danger of fracturing, easily made dove-tailing towards the bottom of the cavity, a better re-

tention can be made for this material than we possibly can make for a porcelain inlay.

Second, these shallow labial cavities in the gold would result in thin and brittle porcelain inlays, especially at the incisal and proximal margins, which disadvantage is avoided when using the plastic cement.

Third, with silicate cement we avoid the dark show line, where tooth structure and porcelain approach each other.

Resuming what I wrote on this subject above, I conclude that in restoring compound cavities in anterior teeth in this manner by the combination filling, we make use of two materials most suitable for the purpose, both in their right place. Gold is there to resist the heavy wear of mastication; silicate cement is inserted where for esthetic reasons gold is objectionable in a location with a minimum danger for the dissolving action we find in large proximal cavities. In those mouths possessing a rapidly dissolving action on silicate cement, we can make use of a porcelain inlay or replace the cement filling once in a while. But even under these unfavorable conditions we will find these cavities keep their cement filling longer than at the other surfaces, as the insertion occurs under the most promising circumstances, the entire surface of the filling being accessible for the burnishing instruments, so that the filling material can be condensed under pressure to its greatest resistance power.

I felt I was under obligations to give reasons for my opinion about the usefulness of the combination filling and close in the belief of having discharged a duty. I am, Mr. Editor,

Very truly yours, •

M. P. HOMAN.

OBITUARY.

DR. J. N. CROUSE.

Just as we go to press we are pained to announce the death of Dr. Crouse. The following brief notice was furnished by Dr. G. N. West:

JOHN NATHAN CROUSE, D. D. S.

Born Sept. 15, 1842. Died Jan. 16, 1914. Dr. Crouse was born near Downington, Chester county, Pa. Early education in

village schools of Pennsylvania and Illinois; then in Mt. Carroll (Ill.) Seminary, 1859-62. Received D. D. S. degree at Pennsylvania Dental College, Philadelphia, 1867. Began practice of dentistry in Mt. Carroll, Ill., 1864, and since 1868 has been in practice in Chicago. Last surviving charter member of Illinois State Dental Society. Founded Dental Protective Association and was its president until December, 1913. Member of National Dental Association, Chicago Dental Society and Calumet Club. Leaves a widow and son, Dean.

DR. GEORGE W. COOK.

We noted in our last issue the sudden death of Dr. Cook, and we herewith publish a fuller account written by the Rev. C. M. Filer of Hebron, Indiana, which was the country home of Dr. Cook:

Dr. Geo. W. Cook was born in Kentucky, of southern parentage, in 1866. Died at his home in Hebron, Indiana, Dec. 21, 1913, after a brief illness of some twenty-four hours, his death being due to apoplexy.

The war having destroyed every prospect of his parents in the south, Dr. Cook came with them at the age of two years, into southern Illinois, locating in Harrisburg, Saline county. Soon after this the father died, leaving the mother with three children. A year or two later the mother died, leaving the children unprovided for.

At eight George lived in the families of farmers of the neighborhood. At eleven he went to live with Dr. Hastings, near Carbondale, Ill. Here he attended school, doing all kinds of work. The doctor had a very large surgical practice in the country, and the boy was soon taught to administer ether and chloroform for surgical operations, in the meantime studying anatomy and physiology, and his daily duty soon became that of dressing wounds, extracting teeth, etc.

At sixteen he obtained a position in the Southern Illinois Hospital for the Insane, and from the medical staff here he obtained valuable training in anatomy and physiology. Having a great capacity for hard work, he had become a proficient druggist, at the same time attending almost all the post mortems in the institution. When cocaine was introduced Dr. Cook with

assistance made a long series of experiments with this drug as a local agent for the relief of pain.

Having already desired to study dentistry, he went to Chi-



DR. GEORGE W. COOK.

cago, where his brother, Dr. John C. Cook, advised a broad education. He attended one year's lectures at the Northwestern Dental College, taking only the medical course. He went from

there to the University of Iowa, graduating in 1890, when he returned to Chicago, spending most of that year and part of the next in L. P. Haskell's post graduate school of mechanical dentistry. After completing his work there, he opened an office on the south side, Chicago. After the close of the Columbian Exposition he again took up the study of bacteriology and pathology, under Dr. Stanley P. Black, who at that time was pathologist at Mercy Hospital, spending five half days a week for about two years. Upon his brother's return from Europe, where he had been studying the same subject, together they fitted up a private laboratory where considerable work was done of a practical nature. In 1895 and 1896 he attended Dr. Fenger's surgical clinic and at the dispensary made a study of infection through decayed teeth, demonstrating that tubercular infection will take place through open pulp canals. In addition, Dr. Cook enjoyed instruction under a number of Chicago's best known physicians and surgeons.

He was professor of oral surgery at the Northwestern College of Dental Surgery. He was a member of the National, the Illinois and the Chicago Dental societies, the Odontological Society of Chicago, an honorary member of the Southwestern Dental Association of Michigan; was a member of the World's Columbian Dental Congress in 1893, was elected president of Chicago Dental Society in 1900, and was a delegate to the International Dental College in Paris the same year.

Dr. Cook has written many papers along the line of his profession and his scientific study; was dean of the Illinois School of Dentistry for a number of years, and professor of pathology and bacteriology until about two years ago, since which time he has been very much interested in farm and country life, having begun operations on the McGill farm, near Hebron, where he had a splendid beginning in stock raising.

Dr. Cook leaves no nearer relatives than nephews, his brother having died some years ago, except his wife, Mrs. Margaret McGill Cook, to whom he was married in the autumn of 1907, since which time he divided his time between Hebron and his professional work in the city, where he retained his office until his death.

Dr. Cook was called very suddenly. On Saturday, the 20th,

he and Mrs. Cook had invited in some friends for the day, and he spent the entire day making himself agreeable to his guests, as everyone knows he was accustomed to do, and that he was able to do. The writer of this sketch left him at about 9:30 Saturday evening in his usual health and spirits, when he assured us he had spent an enjoyable day. When he retired that night his plans were all laid from an early breakfast to his departing for the city on Monday.

About one o'clock his condition was discovered and medical aid summoned. He lingered until near eight o'clock on the evening of Sabbath, and thus is fulfilled the saying, "In such an hour as ye think not."

C. M. FILER.

Note.—The greater part of the above sketch is copied from a publication of the College of Physicians and Surgeons, Chicago.

C. M. F.

PRACTICAL HINTS.

Edited by J. E. Schaefer, D. D. S.

(This department is for busy readers. We want short articles containing practical hints—the shorter the better. No article must exceed 200 words, unless of exceptional merit. Every dentist has some useful hint that has been of value to him, and if he will only put it in print it may be of equal value to others. That is what this department is for. Due credit will be given for every article sent. Address J. E. Schaefer, 1745 W. Harrison St., Chicago, Ill.)

Reduce Inlay Failures:—Apply the rubber dam after the cavity has been nearly prepared in all cavities that you have any suspicion of white decay at the gingival margin, after which you can easily detect and remove, and at the same time not impose the rubber dam on your patient but a very few minutes.—*A. W. Guillory, D. D. S., Kinder, La.*

Root Adaptation:—In a so-called coping or band, for any root where a crown is to be made, better results can be obtained by swedging over a cement model than any method I know of. It takes very little burnishing in the mouth to get a perfect adaptation.—*J. Pearce, D. D. S., Peoria, Ill.*

To Avoid Bubbles in Casting:—Do not paint wax model with camel's hair brush or any other device, but wind a few fibers of cotton on a toothpick, use same as a dropper to carry your investment. Do not smear, but blow your investment to place with a chip blower. Other steps followed according to the recognized technique principles, your castings will come out smooth and will fit perfectly without retouching.—*M. J. Ruzicka, D. D. S., Prague, Nebr.*

Analgesia:—All general anesthetic agents have their analgesic stage. Analgesia can be induced by inhalation of nitrous oxid and oxygen, nitrous oxid and air, somnoform, ether, chloroform, ethyl chlorid, ethyl bromid, and other agents not so generally known, but for dental purposes I believe that nitrous oxid and somnoform are to be preferred above all other general anesthetics for analgesia induction.—*Harper De Ford, D. D. S., M. D., Des Moines, Ia.*

Objections to Band Clasps:—In order that the band clasp may be useful for any length of time, it must be fitted reasonably accurately and have some positive means for preventing it from settling down and losing its relation to the tooth to which it was fitted. The wide band clasp when fitted around the natural tooth by any method invites decay, but it is more particularly harmful when adjusted without the occlusal lug or some similar means of preventing it from settling.—*F. E. Roach, D. D. S., Chicago, Ill.*

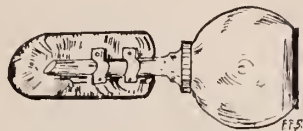
A Short, Accurate Method of Adapting a Porcelain Crown:—Prepare root as desired, grind crown to approximately fit root, adjust post, mix synthetic porcelain as for filling, cover base of crown with the prepared porcelain, insert post in crown, dry root of tooth, place piece of tin foil over end of root to exclude secretions, place crown in position, holding in place until porcelain is partially set, remove crown and post intact, lay aside for about fifteen minutes until porcelain is thoroughly crystalized, then polish and set with cement.—*A. M. Wilkes, D. D. S., Farmer City.*

The Pericementum:—Dentistry should and must awaken to a study of the relative importance of pulp and pericemental life; for the latter is most intimately associated with the health and salvation of the teeth. Some one has said that more than half the teeth that are lost are lost from diseased conditions of the external or pericemental tissues of the teeth. (This estimate is undoubtedly exaggerated.) All necrosis of these tissues begins in the pericementum and is wholly the result of local irritation. The pericementum controls only the thin bone covering of the root, which we know as the cementum, but in this it controls the most important source of life to the tooth. Dentistry has not yet generally recognized, certainly not in practice, that the important part of a tooth is not its crown, but that is the root. The cemental life of the root preserved through the pericementum, the essential part of the vitality of the tooth is preserved. If the life of the root is injured or destroyed, the indispensable life of the tooth is injured or destroyed.—*Smith*.

Compress Air to Desensitize Dentin:—The *modus operandi*—no previous preparation of the patient is necessary. You operate without putting on the rubber dam. The saliva syphon in place and cotton rolls where needed, and changed when necessary. Your assistant now starts the application of the air, beginning with a jet so minute that it is not felt by the tooth. If it should be felt, place a pledget of cotton into the cavity—and direct the jet of air upon that. In a few seconds the tooth will become used to the air and the cotton removed. Gradually increase the air until you are giving the full force of the 40 pounds pressure, taking about a minute and a half. In the meantime you will lay out on the table what instruments, burs and stones you expect to use in preparing the cavity. Your assistant keeps the air playing into the cavity all the time without any let up—if the air was stopped sensitiveness would return to the tooth in about a half minute. Now begin on a part of the cavity that you know will not hurt, and in that way let the fact that you are cutting the tooth and that it is not hurting sink into the mind of the patient. Soon you will go into other parts of the cavity and have it all complete before you know it, and the patient will not have suf-

fered any pain—and lastly, the whole operation is so simple and quickly performed that you would be all through while other methods were getting their paraphernalia adjusted.—*W. T. Reeves, D. D. S., Chicago.*

The Water Syringe as a Tongue Depressor, Cheek Retractor and Light Reflector:—You will all agree that in grinding roots or teeth in preparation for crown or bridgework, that water is most important, the right amount, at the right place and at the right time. With an office assistant the problem is but partly solved. Most practitioners are without office assistant, and find it in most cases difficult, especially on posterior teeth, to furnish water to their stones, to retract the cheek or depress the tongue and reflect light.



If you take an air syringe, cut down the stem to $1\frac{1}{2}$ inches long, bend up a piece of plate aluminum with a slight hollow in the center and rivet stem to it, you will find you can retract the cheek, protect it from burns or lacerations and depress the tongue for grinding on lingual surfaces. If you keep the shield polished it will reflect light.—*F. F. Schwartz, D. D. S., Chicago, Ill.*

Normal Salt Solution for Root Canal Treatments:—Uniformly good results obtained from the use of normal salt solution for treating various diseases of the dental pulp, and especially those cases in which the irritation or infection extends to or beyond the root apex, have been so gratifying that I am led to believe that this simple remedy really possesses much of value for this class of work. Experience with it in many cases of decidedly severe irritation resulting from almost every cause, such as infection of apical tissue due to gangrenous pulps, soreness resulting from over use of drugs in the root canals, such as the various formalin preparations, or the post operative pain incident to pulp removal in young patients where the apical foramina are usually large, as well as many other cases wherein the etiology seemed more obscure, admits of no other conclusion.

The remedy, being harmless, can and should be used freely, care being exercised, however, to keep the solution absolutely sterile and the operative field clean. The objective point in its use being to bathe or irrigate the inflamed tissues thoroughly, when the canal is open and free from infectious material itself the solution can easily be pumped to the apex with a broach; although obviously it requires considerable caution in cases where the canal contains a putrescent pulp, which, of course, should first be removed. It has also been employed to advantage in the treatment of alveolar abscesses which open through the gum, by irrigating the fistulous tract via the root canal several times daily, using an ounce or more of the solution each time. Between treatments each canal should be left with saturated dressing of the solution, and the pulp chamber closed.—*R. S. Towne, D. D. S., Bismarck, North Dakota.*

Removable Bridgework:—The ideal attachment is one that permits of a range of movement of the removable parts to relieve the tooth or teeth carrying the attachments from undue strain. The chief requirement of the attachment is to hold the removable parts in a more or less close relation to the sustaining alveolar ridge. Such an ideal attachment is found in the Roach attachment, the principle of which is a ball and socket joint permitting of a wide range of movement, and yet holding the parts in their proper places. This ball and socket joint allows the most important movement, the settling of the fixture onto the alveolar ridge. As the latter is absorbed away, and it is a well known fact that the supporting alveolar ridge does absorb, it fails to support the removable part when stress is brought to bear on the ridge, unless provision is made for settling.

The Roach attachment is applicable to any form of removable fixture, regardless of its complications, for the reason that this attachment requires no alignment apparatus in the construction.

The most approved method of applying the attachment is to provide for an upright spur which becomes a part of the tube portion of the attachment to be bent against the contact of the tooth carrying the ball. This holds the heel of the saddle up or down, as the case may be. This spur is formed by bending a square 18-gauge iridio-platinum wire at right angles and soldering at one side of the

tube, one end of the wire forming a spur, the other end forms a means of attachment to the saddle.

The bicuspid and molar teeth of one side of the lower jaw can be restored very satisfactorily by preparing a crown, or gold inlay, for the cuspid or bicuspid tooth remaining on that side. A Roach ball is used near the gingival so as to permit a shoulder to extend vertically in the crown or inlay, linguallly to the ball, engaging the upright spur attached to the tube. This method prevents buccal tipping of the bridge. The lingual bar extends to a bicuspid or molar inlay or crown on the opposite side of the mouth, prepared with a slot to receive the end of the lingual bar, supporting the bridge from lingual tipping. This arrangement will permit the saddle to settle on the alveolar ridge and as it settles deeper at the heel the spur wire may be bent to contact with the inlay or crown holding the saddle close to the ridge.—*M. L. Schmitz, D. D. S.*

MEMORANDA.

[Society notices will be given insertion in this department free of charge. Subsequent insertions will be charged for at the rate of \$2.00 an inch.]

WASHINGTON STATE BOARD.

This board will hold its next examination in May 1914, at Seattle.

R. L. Moak,
Secretary, Montesano, Wash.

MERCK'S REPORT.

Volume XXVI of E. Merck's (New York) Annual Report of Recent Advance in Pharmaceutical Chemistry and Therapeutics is out. The edition is limited and is distributed principally among teachers of materia medica and therapeutics, and medical and pharmaceutical libraries, but a few copies are usually left over and may be obtained by sending fifteen cents for each copy—the forwarding charges.

CHICAGO DENTAL SOCIETY.

At the annual meeting of the Chicago Dental Society held December 16, 1913, the following officers were elected for the ensuing year: President, T. L. Grisamore; vice-president, F. B. Moorehead; secretary, P. B. D. Idler; treasurer, R. E. MacBoyle; librarian, E. D. Collidge; two members on the Board of Directors, J. P. Buckley and Geo. C. Poundstone; board of censors, T. A. Broadbent, L. H. Arnold and Ashley M. Hewett.

T. L. GRISAMORE,
Secretary.

KENTUCKY STATE DENTAL ASSOCIATION.

The Kentucky State Dental Association will hold a four days' post graduate course at the Seelbach Hotel, in Louisville, March 9, 10, 11 and 12, 1914. The lecturers for the course are Dr. Geo. H. Wilson of Cleveland,

"Prosthetic Dentistry;" Dr. Thos. P. Hinman of Atlanta, "Operative Dentistry;" and Dr. A. J. Bush of Columbus, "Crown and Bridge Work." We will also have papers and clinics for those who do not care to take the post graduate course. The usual invitation is extended to all ethical practitioners to attend. We are already assured of a successful meeting.

CHAS. R. SHACKLETTE,
Secretary.

CHICAGO DENTAL RESEARCH CLUB.

Realizing the urgent need for research work in dentistry a number of Chicago men have organized classes for the purpose of studying more minutely the foundation principles of medical and dental science, one of these classes has also formed a Research Club, and will establish regular quarters in a down town building where the members may carry on work in physiological chemistry under the guidance of some professional. We give our cordial good wishes to this club with the hope that it may result in much benefit to the profession and to the people. The present officers of the club are Dr. H. H. Schuhmann, president; Dr. L. K. Stewart, vice-president, and Dr. Lester Bryant, secretary and treasurer.

TEXAS STATE DENTAL ASSOCIATION.

The thirty-fourth annual meeting of the Texas State Dental Association will be held at Fort Worth, Texas, April 13-17, 1914. In addition to the regular program, the Oklahoma Post-Graduate plan will be tried at this meeting. Dr. Geo. H. Wilson of Cleveland will present Prosthetics with special reference to anatomical occlusion, and Dr. Frank H. Skinner of Chicago, Pyorrhoea, Prophylaxis and Removable Bridge-work in connection with same. For information relative to space for exhibits, or as to clinics, address Dr. W. H. Nugent, Fort Worth, Texas. Any other information will be cheerfully furnished by the Secretary.

J. G. FIFE,
Secretary-Treasurer, Dallas, Texas.

PRIZE CONTEST.

With the year 1914 begins the thirtieth anniversary of the ÖSTERR.-UNGAR. VIERTELJAHRSSCHRIFT für ZAHNHEILKUNDE," Vienna (Austria), I. Petersplatz 7. In commemoration the editor offers three prizes as follows:

1. 1,000 kronen (£40, or \$200).
2. 600 kronen (£24, or \$120).
3. 400 kronen (£16, or \$ 80).

For scientific work from any branch of dentistry, theoretical or practical, but awarded according to its clinical value.

Herr Reg.-Rat Professor Dr. Julius Scheff has accepted the chairmanship of the committee to judge and award prizes.

Contest Requirements—

1. The contest is open to dentists of all countries. In case the work is in a foreign language a German translation is to be included with the application.
2. The work must be that which has not before appeared in print.
3. The work must be anonymously sent in, bearing a certain word of identification, with a sealed envelope, bearing the same word, containing the contestant's name and address.
4. The contest closes May 15, 1914, as prizes are awarded July 15, 1914.

5. The successful works will be published in the "Österr.-ungar. Vierteljahrsschrift für Zahnheilkunde" when its size permits.

6. The editor claims the privilege to publish at the customary remuneration any of the works of the unsuccessful contestants.

PANAMA-PACIFIC DENTAL CONGRESS.

More than 3,000 dentists from every part of the civilized world now are expected to attend the Panama-Pacific Dental Congress to be held in San Francisco during the Panama-Pacific International Exposition, which will be open from February 20 to December 4, 1915, inclusive. The Dental Congress, which is being promoted by prominent dentists of the Pacific Coast, promises to be the largest gathering of dentists ever held and will be the motive for discussions and addresses on the latest advances in dentistry. The Congress will convene August 30, 1915, and will remain in session for ten days. A feature of the Congress will be a great clinic, at which the latest methods of dental surgery, practiced in every country of the world, will be demonstrated. It is expected that dentists of international reputation will attend the Congress, and the discussions of the thousands of delegates will mark an epoch in the history of dentistry. "Representatives of every country where dentistry is practiced will attend this Congress," said Dr. Frank L. Platt of San Francisco, who is chairman of the local committee of organization. "It will be a thoroughly international gathering. Papers will be read on the most advanced subjects known to the profession, and many of the participants will be men of international reputation. The latest methods used by dentists in various countries will be demonstrated in a great clinic, where there will be from twenty-five to fifty chairs, and all kinds of dental operations will be performed for the benefit of the thousands of assembled dentists." The Dental Congress will be financed by a corporation known as the Pacific Dental Congress Commission of 1915. Pacific Coast dentists already have subscribed \$13,000 for the promotion of the Congress, and of this \$7,000 has been collected to date. This money is being used in publicity work and invitations to the Congress are being sent out broadcast over the world. Executive committees are being appointed in every country where a dental organization exists. A striking feature of the Congress will be the exhibits by dental manufacturers and dealers, which will include modern apparatus and appliances. As the Congress will meet in the new Municipal Auditorium, this array of interesting exhibits will be housed in the same building during the sessions of the Congress. Two thousand front feet of space will be occupied by the exhibits. While these exhibits will be on display only during the Congress, there will be an extensive array of dental exhibits throughout the Exposition in the Palace of Liberal Arts, one of the eight main exhibit palaces. These will include apparatus and instruments used in dentistry, specimens of bridge and plate work, and the latest electrical devices used in dental surgery.

SIXTH INTERNATIONAL DENTAL CONGRESS AT LONDON, AUGUST 3, TO 8, 1914.

The Committee on Transportation of the National Dental Association have completed arrangements with the International Mercantile Marine Company, comprising the American, Atlantic Transport, Leyland, Red Star, White Star and White Star-Dominion Lines, whose fleet includes such large, splendid and steady steamers as the "Olympic," "Oceanic," "Adriatic," "Baltic," "Cedric," "Celtic," "Lapland," "Minnewaska," "Minnehaha," "Minnetonka," "Minneapolis," "Laurentic" and "Megantic," sailing to and from numerous prominent ports in England and the Continent, and application for sailings

and rates should be sent in at once. Our delegates to the Congress will be allowed a reduction of 25 per cent from tariff rates on all steamers of the I. M. M. Co. lines sailing on and after July 9 from America, and to August 20 from Great Britain and Europe, with the single exception of the "Olympic," August 19 from Southampton and Cherbourg for New York. Please note that when the concession referred to would bring the price for passage below the minimum rate of the steamer selected, the lowest rate of that steamer will be charged as follows: "Olympic," \$130 to or from Plymouth, Cherbourg and Southampton; "Oceanic," \$110 to or from Plymouth, Cherbourg and Southampton; "Adriatic," \$110 to or from Queenstown and Liverpool; "Baltic," "Cedric" and "Celtic," \$100 to or from Queenstown and Liverpool; "Lapland," \$97.50 to or from Dover and Antwerp; other Red Star Line steamers, \$85 to or from Dover and Antwerp; "Majestic," \$95 to or from Plymouth, Cherbourg and Southampton; Atlantic Transport Line, \$85 to or from London; "Laurentic" and "Megantic," \$92.50 between Montreal, Quebec, Liverpool. It is important in order to obtain good accommodation that delegates to the Congress should communicate at once regarding reservations with the International Mercantile Marine Company, 9 Broadway, New York City, stating the dates of their proposed outward and return sailings, also their requirements as to accommodations. Applications will be filled in the order of their receipt. A deposit of 25 per cent of the east-bound passage money is required when the reservation is made, the balance for the round trip being payable at least three weeks prior to the outward sailing. The committee will also reserve dining saloon seats, steamer chairs and rugs, the deck chairs and rugs renting at \$1 each for the voyage. Seats can also be reserved on the trains to London, for which the rates, first-class, are as follows: Via Southampton, \$2.75; via Plymouth, \$7.50; via Liverpool, \$7; via Dover, \$4.75. The committee also calls the attention of delegates to the Travelers' Checks issued by the International Mercantile Marine Company in denominations of \$10, \$20, \$50, \$100 and \$500, which will be found the safest and most convenient way of carrying funds, as the checks are accepted by hotels, shops, banks, etc., throughout Great Britain and Europe. These are issued for their face value, plus one-half of 1 per cent commission, and checks not used will be redeemed at face value. It will be to the advantage of the Association for its members to use these checks. As the White Star sailings available for the Congress from New York are on July 9, 11, 16 and 18, arrangements have been made with the Holland-American Line for those who wish to sail on Tuesday, July 14, to do so on their steamer "New Amsterdam," on which the following rates have been secured: They will allow a discount of 25 per cent on the tariff rate for all rooms on deck A (except the *chambres de luxe*), with the understanding that each room be occupied by three passengers. On decks B and C they will place all outside and inside rooms we require at our disposal at the minimum rate per berth, provided that each room be occupied by three passengers; the number of passengers to be carried to be divided in proportion to the available accommodations on decks A, B and C. Any communications concerning this boat should be sent to Mr. Nyland, Holland-American Line, 21 State street, New York City.

HERBERT L. WHEELER, Committee,
560 Fifth Avenue, New York City.

THE SIXTH INTERNATIONAL DENTAL CONGRESS, LONDON, ENGLAND,
AUGUST 3 TO 8, 1914.

The Sixth International Dental Congress will be held in London, England, August 3 to 8, 1914. The committee appointed by the National Dental Association having in charge the affairs of the Congress relating to the United States of America have selected the following to take part in the

Congress program: *Addresses*—Dr. H. J. Burkhart, Batavia, N. Y., to deliver the address on behalf of the National Dental Association at the opening session; Dr. Edward C. Kirk, Philadelphia, Pa., address before the general session, the afternoon session of the opening day, title "The Tendencies in Dental Education." *Reporters*—Section 1, Dental Anatomy, Histology and Physiology: "The Evolution of the Human Dentition," Dr. I. N. Broomell, Philadelphia, Pa.; "Calcification," Dr. A. R. Starr, New York City, N. Y.; "Chemistry and Physiology of Saliva," Dr. Edward C. Kirk, Philadelphia, Pa. Section 2, Dental Pathology and Bacteriology: "The Etiology of Dental Caries," Dr. B. Holly Smith, Baltimore, Md.; "The Etiology and Pathology of "Pyorrhoea Alveolaris," Dr. Percy R. Howe, Boston, Mass.; "Pathological Conditions of the Dental Pulp," Dr. R. W. Bunting, Ann Arbor, Mich.; "The Pathology of the Antrum," Dr. Charles H. Oakman, Detroit, Mich. Section 3, Dental Surgery and Therapeutics: "Inflammatory Diseases of the Gingival Margin and Periodontal Membrane, Pyorrhoea Alveolaris," Dr. T. Sidney Smith, Palo Alto, Cal.; "Restorations of Lost Portions of Tooth Substance by Inlaying," Dr. R. Ottolengui, New York City, N. Y.; "Oral Sepsis in Relation to General Disease," Dr. C. N. Johnson, Chicago, Ill.; "The Prevention of Oral Sepsis by Treatment," Dr. J. D. Patterson, Kansas City, Mo. Section 4, Dental Physics, Radiography and Metallurgy: "The Uses and Advantages of X-Rays as an Aid to Diagnosis, including the Differentiation of the Radiography Appearances of Normal and Abnormal Tissue," Dr. Howard R. Raper, Indianapolis, Ind.; "The Structural and Other Changes Arising in Connection with Metals Used in the Mouth," Dr. Clarence J. Grieves, Baltimore, Md.; "The Theory and Practice of Pressure Casting," Dr. Weston A. Price, Cleveland, Ohio. Section 5, Dental Prosthesis: "Articulation and Articulators," Dr. J. H. Prothero, Chicago, Ill.; "Design and Retention of Partial Dentures," Dr. H. J. Goslee, Chicago, Ill. Section 7, Oral Surgery and Surgical Prosthesis: "The Late Results of Cleft Palate Operations," Dr. Truman W. Brophy, Chicago, Ill.; "The Treatment of Dental and Dentigerous Cysts," Dr. Wm. Carr, New York City, N. Y.; "Surgical Prosthesis of the Jaws," Dr. M. C. Smith, Lynn, Mass. Section 8, Anaesthesia, General and Local: "Gas and Oxygen, Alone, in Mixture and in Sequence, for the Extraction Operation," Dr. Chas. K. Teter, Cleveland, Ohio; "Gas and Oxygen Analgesia for Conservative Operations," Dr. Thos. B. Hartzell, Minneapolis, Minn.; "Local Anaesthesia with Special References to (a) Methods, (b) Drugs, (c) Sphere of Usefulness, (d) Contra-Indications and Dangers," Dr. Eugene R. Warner, Denver, Colo. Section 9, Oral Hygiene, Public Instruction and Public Dental Service: "The Effects of Dental Treatment on National Health and Physique," Dr. Herbert L. Wheeler, New York City; "Prophylaxis at Different Ages," Dr. A. R. Melendy, Knoxville, Tenn.; "Lantern Demonstration of Slides Showing (a) Means of Affording Public Instruction in Dental Hygiene, e. g., Lecture Material, Charts, etc., (b) Photographs of School Dental Clinics, Institution for Public Dental Service for Adults and Other Institutions in Which Public Dental Treatment Is Being Carried Out," Dr. Wm. A. White Phelps, New York. Section 10, Dental Education: "Methods of Teaching Orthodontics to Dental Students," Dr. S. H. Guilford, Philadelphia, Pa. The following have been selected as honorary presidents of the sections: Section 1, Dental Anatomy, Histology and Physiology, Dr. Mathew H. Cryer, Philadelphia, Pa.; Section 2, Dental Pathology and Bacteriology, Dr. Thos. B. Hartzell, Minneapolis, Minn.; Section 3, Dental Surgery and Therapeutics, Dr. Edward S. Gaylord, New Haven, Conn.; Section 4, Dental Physics, Radiography and Metallurgy, Dr. J. P. Buckley, Chicago, Ill.; Section 5, Dental Prosthesis, Dr. D. O. M. LeCron, London, England; Section 6, Orthodontics, Dr. Roscoe A. Day, San Francisco, Cal.; Section 7, Oral Surgery and Surgical Pros-

thesis, Dr. J. D. Patterson, Kansas City, Mo.; Section 8, Anaesthesia, General and Local, Dr. Thos. P. Hinman, Atlanta, Ga.; Section 9, Oral Hygiene, Public Instruction and Public Dental Services, Dr. Herbert L. Wheeler, New York City; Section 10, Dental Education, Dr. Henry W. Morgan, Nashville, Tenn. A list of essayists and clinicians will be published later. The committee invite the ethical members of the profession of the United States of America to become members of the Congress. Membership, which includes admission to the Congress sessions and a copy of the proceedings, is \$7.50, and for members of their families accompanying them \$3.75. Dr. Herbert L. Wheeler, 560 Fifth avenue, New York City, has been appointed by the committee to arrange for steamship rates, sailing dates, itinerary, etc. Those desiring to attend the Congress, sailing with the American delegation, immediately following the meeting of the National Dental Association, Rochester, N. Y., July 10, 1914, are requested to correspond with Dr. Wheeler.

Committee—Truman W. Brophy, Chairman; Wm. Carr, S. H. Guilford, Waldo E. Boardman.

BURTON LEE THORPE, Secretary,
3605 Lindell Boulevard, St. Louis, Mo.

OKLAHOMA STATE DENTAL ASSOCIATION.

The next meeting and third annual post-graduate course of the Oklahoma State Dental Association will be held in Oklahoma City, March 30 to April 4, 1914. Drs. Jos. B. Eby and Thos. P. Hinman of Atlanta, Ga., are to be the lecturers. An important feature of the course will be a progressive clinic, conducted two afternoons of the week by noted clinicians from out of the state.—C. R. Laurence, Secretary, Enid, Okla.

INDIANA STATE BOARD OF DENTAL EXAMINERS.

The registration of dentists under the new Indiana law is well under way. The new law calls for the annual registration of all dentists who have ever registered in Indiana, whether they are practicing in the state or not, if they wish to retain the right to practice at any future time. Section 9 provides as the penalty for failure to renew within a period of three months after December 31 of each year, the cancellation of said license. Provided that any license thus cancelled may be restored by the board upon the payment of a fee of \$5, if paid within one year after said cancellation. There is no provision for the restoration of a license thus cancelled after a period of one year. Dentists eligible to register should immediately send for application blanks to F. R. Henshaw, Secretary and Treasurer, 507-8 Pythian Building, Indianapolis, Indiana.

RESOLUTIONS PASSED BY THE ODONTOLOGICAL SOCIETY OF CHICAGO.

Whereas, The Odontological Society of Chicago is once more called upon to record the death of one of its most eminent members—Dr. George Washington Cook, who died on December 21, 1913, and

Whereas, The members of this Society in meeting assembled, fully realizing that a link of inestimable friendship has been suddenly snapped in the affairs of society relationship; and

Whereas, The Odontological Society in the expression of bereavement must fully recognize that the life of Dr. Cook was one of love and unceasing devotion to scientific investigation. His numerous contributions to dental literature specially evidenced the mental activity of a well trained mind; therefore be it

Resolved, That these resolutions be spread upon the records of this Society and that a copy be sent to the family of the deceased, and to the various dental journals for publication.

J. E. HINKINS,
J. G. REID.

THE DENTAL REVIEW.

Vol. XXVIII.

CHICAGO, MARCH, 1914.

No. 3

THE DIFFERENTIAL DIAGNOSIS AND TREATMENT OF CERTAIN DISEASES OF THE SOFT TISSUES OF THE MOUTH.*

BY J. P. BUCKLEY, PH. G., D. D. S., CHICAGO, ILLINOIS.

In discussing the differential diagnosis and treatment of certain diseases of the soft tissues of the mouth, as I have been requested to do by your program committee, I shall confine myself largely in this paper to such diseases as are not directly associated with the teeth, and with which the dentist should be thoroughly familiar. Our profession has been criticised in the past, and perhaps in a measure justly so, because it is claimed that in our examination of the mouth we have been looking only for cavities in the teeth and have not noted, at the same time, the condition of the oral mucous membrane and soft tissues. The tendency is to broaden our perspective, and the live dentist of today realizes the importance of a knowledge of the pathology of the soft tissues of the mouth as well as of the teeth themselves. I feel that this is evidenced by the fact that among the many invitations which I have received this past summer from different dental societies, three have requested a paper along this line; and I desire here to congratulate your program committee on their progressiveness.

The mouth is an incubator for many kinds of bacteria, as will be shown later, and is therefore a fruitful field for diseases of almost every description. Some of these diseases are purely local, having certain definite causes, while others are local mani-

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festations of some general disorder. Even those diseases that are caused by local infections are influenced in most instances by the condition of the stomach or general metabolism of the individual. The mouth and the stomach are intimately connected and closely related; so much so in fact that pathologic conditions in the one often predispose to disease in the other. We can more readily understand the close relation that exists between diseases of these two organs when we remember that much of the septic material of the mouth ultimately finds its way to the stomach and intestines, and the toxins absorbed from the digestive tract are frequently excreted in the saliva. Michaels claimed the saliva to be pathognomonic of certain systemic diseases, the diagnosis being made by him solely by physical and chemic examinations of the saliva.

Some of the diseases of the mouth are characteristic and easily differentiated and diagnosed; while the correct interpretation of the clinical manifestations of others is exceedingly difficult and often-times baffle the most skilled diagnostician. In our larger cities we are fortunate in having the pathological laboratories which must frequently be used in order to confirm our clinical diagnosis.

SYPHILIS.

I shall first direct your attention to the discussion of syphilis, a chronic infectious disease now known to be produced by a specific microorganism, the *spirochaete pallida*—a germ discovered March 3, 1905, by Schaudinn and Hoffman. Syphilis is a much more common disease than is generally supposed, and it is essential that every practicing dentist be familiar with its characteristic symptoms. Skill in the diagnosis of syphilitic manifestations is of the utmost importance, not only for the protection of the dentist himself, but for the protection of his patients as well. It matters not whether the dentist ever expects to treat a case of syphilis, the menace of the presence of this disease can only be avoided by the careful and intelligent reading of the clinical symptoms.

Acquired extragenital syphilis is primarily manifested in and about the soft tissues of the mouth in what is known as the initial lesion or hard chancre, which, as a rule, develops in from three to six weeks after infection. The chancre may occur in

various locations on the lips, tips of the tongue, and the pharynx—and is characteristic of what is recognized as primary symptoms. The infection here is produced by direct contact of the spirochaete pallida with an abraded surface. The principal means of conveying the infection extragenitally is through the act of kissing, using the common drinking cup, and other utensils or instruments which have been contaminated with the germ.

In the locations found in the mouth, chancre is usually single, though it may be multiple. It may appear first as a papule, the superficial cells of which finally ulcerate, with necrosis of the central area quickly following, when a copious and highly infectious discharge comes from the crater-like opening that is forming on the tissues involved. The ulcerations occur in from four to ten days after full development of the chancre, until which time the patient, as a rule, experiences very little pain or discomfort.

The treatment of the primary symptoms of syphilis, until recent years, was considered unimportant. In fact, unless a positive diagnosis could be made, and it is still often difficult to be certain of the diagnosis at this stage of the disease, it was suggested that the treatment be deferred until the diagnosis is established by the manifestations of the secondary symptoms. But thanks to the chemical laboratories of the world and the synthetic products there produced, all this has now been changed. Ehrlich, the discoverer of salvarsan, or '606,' as it is commonly called—the new specific for syphilis, says, "too much weight cannot be laid upon the importance of diagnosing a syphilitic sore as soon as possible. We should certainly not wait for secondaries to develop or until the Wassermann reaction has become positive. In no period of syphilis is salvarsan more strongly indicated than when the chancre is the sole symptom, since with a single injection the chancres are no further manifestations of the disease will appear."

The technique of injecting salvarsan will not be described here, for I believe it to be the duty of the dentist, as soon as he observes the suspicious sore in the mouth to consult with the family physician, who should inaugurate and follow up the specific treatment. Long very properly emphasizes a word of caution here. He says: "It may fall to the dentist to discover

a case of syphilis, by mouth symptoms, where it had not been suspected, but he must be exceedingly cautious about discussing this finding with the patient. He is dealing with a matter for which he has not been consulted, and in any suspicious acts or words of his lie the possibility of much unpleasantness. If the patient be an innocent wife, a statement of his discovery might produce domestic discord. While she would have a most serious grievance, entitling her to our pity, a revelation could only add to her unhappiness. A suggestion that you find evidence of certain general conditions and that she had better see her family physician, would be the proper course; and even this advice must be given tactfully, without arousing suspicion as to the probabilities in the case, for, after all, a mistaken diagnosis is possible."

It is interesting, however, to know something of the history of salvarsan. For a great many years mercury had been the only specific for syphilis, except in the tertiary stage when potassium iodid is indicated. But unfortunately mercury in its curative dose is extremely poisonous, so that small doses have to be used over a long period of time. Because of this disadvantage many attempts have been made to discover a mercurial compound which would fulfill the ideal therapeutic requirement; viz.—to kill the spirochaete by means of a single injection. The nearest approach to this was the discovery of atoxylate of mercury by Uhlenhuth and Manteufel. By using this drug they were able with four injections to kill all of the spirochaete which were produced by local inoculation of the testicles in rabbits. Not only were four injections insufficient to have a like effect in man, but the doses required were much larger comparatively, and, as a result, toxic symptoms developed and recurrences were frequent; so atoxylate of mercury was never extensively employed. The discovery of this product, however, acted as a stimulus and spurred chemists on to further investigation.

It may seem strange to those of you who are more or less familiar with the drugs that have been employed in the treatment of syphilis, that the latest specific for the disease is a compound of arsenic and not of mercury. The formula for '606' is $C_{12}H_{12}N_2O_2As_2$. Ehrlich claims that his discovery was due largely to the well-known fact that the compounds of arsenic

exerted a far greater influence in sleeping sickness than did the compound of mercury, and it was for this disease that atoxyl was discovered. When it was shown in 1905 that syphilis was caused by the spirochaete pallida, a protozon which doubtless belonged to the same group as the germ which produces sleeping sickness (trypanosomes); and since arsenic had often played an important role in the treatment of syphilis, the later synthetic compounds discovered, of which atoxyl was the stimulus, came to be used for syphilis as well as for sleeping sickness.

Thus we are here afforded a practical example of what may come from the work of the committee of the National Dental Association on "Scientific Research," of which Dr. Weston A. Price, of Cleveland, is chairman, and who is doing so much to place the work on a firm and solid foundation.

The manifestations of what is known as the secondary symptoms of syphilis do not begin to appear until from four to six weeks after the development of the hard chancre. If no treatment has been instituted, eruptions on the skin usually mark the beginning of this stage; and frequently quite similar eruptions are found on the oral mucus membrane. These eruptions are accompanied by fever, sometimes preceded by it. Red spots, with darker borders, somewhat angular in form, are seen on the mucous membrane of both sides of the upper lip. They are not eroded and are not characteristic of syphilis; but are the mildest form of lesion involving the buccal mucus membrane in the secondary period of the disease.

Simultaneous with the eruptions and fever, characteristic mucus patches occur, and may be located on any part of the mucosa of the mouth regardless of whether the disease originates primarily or secondarily in the mouth.

The presence of mucous patches is a positive sign of syphilis; and before the discovery of the spirochaete pallida or the introduction of the Wassermann reaction, it was necessary to wait for the appearance of these patches before a positive diagnosis could be made. An aggravated canker sore might be mistaken for a mucous patch; and yet each is characteristic. With the mucous patch there is a sharp line of demarcation between the lesion and the healthy mucous membrane, pain and inflammatory reaction is generally ab-

sent; while canker sores are extremely painful and the immediate area is of a deep red color.

It should be remembered that the mucous patches are exceedingly infectious, generally containing the spirochaete in large numbers; and every precaution should be observed in spreading the infection. In order to understand why syphilitic manifestations are found in the mouth it is important to know that secondary and tertiary syphilis establish themselves with predilection and intensity on such spots as have been irritated and injured. For this reason secondary syphilis has an especial predilection for the mouth, as the mucous membrane and tongue is continually irritated by eating, drinking, biting, smoking, roughened tooth-surfaces, deposits, ill-fitting crowns and bridges, over-hanging fillings, etc.

Before the introduction of salvarsan, mercury was the one drug indicated in the treatment of secondary syphilis. The disease in this stage is manifested in the mouth and leaves its indelible effects upon the gums, jaws and adjacent structures, and mercury has a selective influence upon these structures. In fact, this drug is a specific for the secondary symptoms, though its action, as yet, rests purely upon an empirical bases. It is not even known whether the action of mercury is due to a specific toxicity which the drug may have for the spirochaete or whether it is simply due to its general effects upon metabolism. Sollmann is of the opinion that the former is the case and says, "that mercury is not only palliative, but curative in this stage—congenital as well as acquired—whilst its administration is worse than useless in the first and third stage." If the mercurial treatment is to be instituted, an accurate and positive diagnosis should be made, otherwise disastrous results are almost certain to follow. Quite a few cases of necrosis of the lower maxilla have come under my observation following the administration of mercury in doubtful syphilitic cases. In one case of a little girl seven years old, a sequestrum was exfoliated which contained the erupted first permanent molar and the crowns of the unerupted first and second bicuspid. The case terminated fatally, without a positive diagnosis of congenital syphilis, as was suspected, ever having been made.

Syphilographers have learned from sad experience that mercury can be pushed much farther without producing pyalism, if the mouth has first received a thorough prophylactic treatment. This

includes the removal of all local irritants. In fact it is only when the mouth and teeth are clean that the symptoms of ptyalism are valuable as an index that the system is taking all of the mercury it can absorb without producing marked toxic effects. If the teeth are not clean and smooth and the mucous membrane healthy, it is best to wait until the mouth receives proper attention before attempting to find the minimum toxic dose of the drug; for upon the health of the mucous membrane of the mouth, to a great extent, depends the ability of the patient to take an efficient quantity of mercury without causing salivation.

In the past many dentists have hesitated to work for patients who were known to have the specific disease on account of the danger of self-infection, and thinking it necessary to subsequently discard all instruments used. On this point Logan says, "these syphilitic individuals can be cared for with impunity, if the operator protects his hands with rubber gloves and then scrubs all the instruments employed and boils them for fifteen minutes."

The third or tertiary stage of syphilis may be prevented if proper treatment has been previously inaugurated. In cases not so treated the tertiary symptoms usually occur in from one-half to two years after infection. Gumma mark this stage of the disease and first appear as hard bodies or nodes occurring mostly under the skin, although they may occur under the mucosa of the mouth. They gradually increase in size, become more superficial, with a tendency to break down and ulcerate. When they occur in the region of the hard palate, the underlying bone frequently becomes involved and extensive necrosis of the palate and nasal bones follow. Subperiosteal gumma are especially destructive to bone.

Authorities differ in regard to whether the lesions of tertiary syphilis are infectious. They are probably but slightly so, if at all; however, it is well here also to guard against possible infection. The one drug indicated in the treatment of tertiary syphilis is the great alterative, potassium iodid. In this stage of the disease the efficacy of potassium iodid is equal to that of mercury in the secondary stage, and may be considered a specific.

The question of whether syphilis can be cured or not has been a debatable one in the past, but its cure is no longer questioned by experienced syphilographers. Yet it may be safely stated that few cases are ever permanently cured, for only a small percentage of

patients will continue the treatment sufficiently long, after they feel perfectly well, to effect a permanent cure. My experience has led me to believe that syphilis permanently stamps its indelible effects upon the osseous system, especially the bones of the jaws and nose of the individual thus afflicted in almost every case; and that any subsequent infection like in alveolar abscess or pyorrhea alveolaris, there is likely to be an extensive involvement of the osseous structures, and yield to the ordinary treatment with difficulty.

MERCURIAL STOMATITIS.

This condition frequently follows the administration of mercury and its compounds for the treatment of syphilis and other conditions. Mercury is used for its alterative and tonic effects. As has been previously mentioned, it is a specific for secondary syphilis, and every dentist should be thoroughly familiar with the effects of this metal when taken internally. When small doses of an unirritating preparation of the drug are given continuously for a certain length of time, the first effects are observed in the mouth, for it has a selective influence upon the gums, jaws, and adjacent structures. There is produced an increased flow of saliva, fetor of the breath, redness of the gum margins, and pericementitis, causing soreness of the teeth when the jaws are forcibly brought together. If the drug is not withdrawn upon the appearance of these symptoms, the condition gradually grows worse; salivation becomes excessive (continual drooling) the gums become swollen and spongy, the teeth loosen from their sockets and may be easily extracted with the fingers, the tongue and parotid glands enlarge—the former sometimes to the extent that it protrudes from the mouth, often having deep sloughing ulcers made by indentations of the teeth upon its edges, also upon the mucous membrane of the cheeks; and, finally, the soft tissues around the teeth slough away, necrosis of the bone set in, and large sequestra form. This group of symptoms is known as ptyalism or salivation. In these cases the general health is naturally affected, the patient becoming pale and loses flesh. Chronic mercurial poisoning occurs frequently in workmen who handle the metal or who are exposed to its fumes, such as makers of thermometers, mirrors, scientific instruments, etc. The condition, however, is too frequently produced by the prolonged use of mercury as a medicine.

In the treatment of mercurial stomatitis, discontinuance of the

mercury and mouth hygiene generally clear up the symptoms, unless they are too severe. In the more aggravated cases, besides discontinuing the use of mercury and employing prophylactic measures, certain medicinal remedies are indicated. The *teeth should not be extracted*, unless so loose that they virtually fall out. Potassium chlorate, dissolved in cinnamon water (ten grains to the fl. oz.), may be used as a mouth wash. Atropin sulphate, administered in medicinal doses twice daily, will control the flow of saliva. The internal administration of potassium iodid is recommended, as it aids in the elimination of mercury by forming with it in the tissues the double soluble salt. When the pain is very severe, morphin sulphate may be given; and tonics are indicated to combat the exhaustion and anemia.

Many homeopathic practitioners object strenuously to the use of amalgams for filling the cavities in the teeth of their patients; some go so far as to order all amalgam fillings removed and fillings of other material substituted, in the belief that enough mercury is gradually absorbed to cause systematic disturbances. The idea is certainly far-fetched, for while metallic mercury can be separated from an amalgam by high compression or heat, it, nevertheless, is combined in the amalgam by a more or less definite chemic union. I have no positive proof to show that mercury cannot be thus absorbed; but by close observation in a long clinical experience no constitutional disturbance from this source have been discovered. The same objections are offered to the wearing of a red-rubber denture, because mercury compounds (oxids) are used as pigments for coloring rubber. Surely with the high heat necessary for vulcanization, the mercury would combine with the other elements to form such insoluble (nonabsorbable) compounds that there would be no danger of systemic disturbances from this source.

ACUTE ULCEROUS GINGIVITIS.

This is a comparatively rare disease. I have seen a number of cases in the mouths of children coming to the College Infirmary for treatment from the so-called "slum districts" of Chicago. This may have been a coincidence, but I have never observed the typical disease in well-kept mouths. It may be regarded as a filth disease. Gilmer well describes it as follows: "The disease attacks simultaneously the gum margins on their buccal or labial aspect about two,

three, or possibly four teeth, at the same time. The ulcers come suddenly, quickly destroying the gingivae down to the alveolar process, but seemingly not invading it, exposing the roots of the teeth to this extent. The margins of the ulcers are everted crater-like, somewhat like chancrous ulcers. The base of the ulcers is overlaid with a grayish-white covering. When this covering is removed, the granulating surface bleeds freely. The lymphatics related to the area become enlarged, and, unlike chancrous lymphatic enlargements, are tender. It is also unlike chancre in that the ulcers are nearly always multiple and exceedingly painful to the touch. Salivation is much increased, with frequent drooling, the breath is fetid, and owing to the absorption of toxic elements, there is a slight rise in temperature. The contiguous lingual gingivae become reddened, but do not participate in the ulceration. The condition has been mistaken for syphilis."

The treatment of acute ulcerous gingivitis is both local and systemic. The local treatment consists in cleansing the ulcer with such agents as hydrogen dioxid, drying the part and applying a ten per cent solution of silver nitrate or a fifty per cent solution of argyrol. Simultaneously with the local treatment, calomel should be administered internally. If the ulceration is checked, complete restoration of the gum tissues by granulation follows. Mouth hygiene should, of course, be instituted and strenuously carried out.

A form of ulcerous gingivitis, somewhat resembling the above condition, frequently occurs in the mouths of young people, especially young men who are addicted to the habit of smoking. The gum in the interproximal space first becomes reddened, then quickly followed by necrosis which extends around the teeth. The gingiva of all the teeth in the mouth may be simultaneously involved. The disease is exceedingly painful, sometimes accompanied by fever and loss of flesh, and, by the dentist who calls almost every disease of the mouth pyorrhea, patients, thus afflicted, have frequently been informed that they were suffering from the latter disease. Generally in these cases the teeth have been neglected, so far as prophylaxis is concerned, and an irritant of some character will be found about the necks of the teeth or under the free margin of the gums. This being about the only symptom that the disease has in common with pyorrhea. In these and all such similar cases the highly astringent pyorrheal remedies should not be employed. What is

needed here is a thorough prophylactic treatment, the local application of mildly stimulating remedies, such as a twenty-five per cent solution of argyrol, and the daily use of an antiseptic mouth wash. If necessary, a cathartic should be prescribed. With the above treatment these disagreeable cases yield nicely.

TUBERCULOSIS.

This dreaded disease is recognized today as the "great white plague." That you may know the change in the attitude of the laity toward this disease in recent years, I will call your attention to the fact that about fifteen years ago, when the campaign against consumption was in its infancy, the Hon. William E. Mason, then United States Senator from Illinois, introduced a bill in Congress asking for an appropriation of ten thousand dollars for the purpose of investigating the causes of tuberculosis and the best means of its prevention. The bill was held up, way-laid, and finally killed; and the spirit thereof was forced to travel that road which leads to nowhere and benefits nobody. In contra-distinction to this, it was authoritatively stated that during the year of 1911 the National Association for the Prevention and Cure of Tuberculosis spent \$14,500,000.00, for the purposes for which the association exists. Some twenty years ago Dr. W. D. Miller, of Berlin, conducted a series of experiments in which he isolated fifty-eight different varieties of germs in the human mouth. Many of these experiments were subsequently verified by Dr. G. V. Black, of Chicago. It is true, that not all of these germs are pathogenic in character, but many of them are; and prominently among the latter is found the germ which produces tuberculosis. Cultures taken from tooth-cavities almost invariably show the presence of one or more disease-producing germs. And why not? Where can you find a more nearly ideal incubator in Nature—pabulum from food remnants and decaying tooth-structure, body heat, moisture, and comparative freedom from disturbance. Out of two-hundred mouths examined by the late Dr. Geo. W. Cook, one hundred and seventy-one show the presence of the tubercule bacilli. About two years ago, Dr. F. B. Moorehead reported, in the *Journal of the American Medical Association*, five cases of tubercular infection of the glands in close proximity to absessed molar teeth, the inference being that the germ gained admittance through the canals of the teeth.

Tuberculosis is a preventable disease. But a few short months

ago we were caused to shudder as we read about and thought of that terrible catastrophe on the sea, where fifteen hundred bodies were buried in the deep and fifteen hundred souls sent unexpectedly to their Maker. Yet we pick up the Bulletin of the Chicago Health Department of April Twelfth, 1913, and read that "more than one hundred and fifty thousand die annually in this country from this preventable plague. At the present time there are nearly one million victims of the disease, practically all of whom are going about spreading the infection." It is estimated that "in Chicago tuberculosis yearly kills about four thousand persons." I say we shudder when we read of a catastrophe; yet we read these, what should be startling facts, turn the page, and give it scarcely a thought.

Tuberculosis occasionally attacks the mucosa of the mouth. Gilmer, who has had an extensive oral surgical practice, reports having seen three cases, one of the tongue, one of the sublingual salivary gland, and one, an extensive involvement, including a part of the lips, the mucosa of the cheek, the soft palate, the tongue, and a portion of the pharynx. The microscope will aid in positively determining tubercular lesions of the mouth, as well as in other parts of the body.

It may fall to the lot of the dentist to first discover a tubercular lesion in the mouth, and thereby aid in making a diagnosis; but the treatment had better be done by the general medical practitioner or specialist, for the cases are rare and no definite local treatment has thus far been established. Though it may be safely stated that the various forms of light have been used in many cases with favorable results.

LEUCOPLAKIA (BUCCALIS AND LINGUALIS).

This is a disease of the mouth and tongue, the etiology of which is yet unknown. A large percentage of the cases of leucoplakia give a previous history of syphilis. It is, therefore, suspected that the latter disease has a causative relation to leucoplakia, though no definite evidence in this respect has been produced. Gilmer, who has seen a large number of cases, is of this opinion. He says: "Many cases of leucoplakia buccalis have come under my observation, and, with few exceptions, I was able to elicit a history of syphilis." The disease manifests itself upon the buccal mucosa,

portions of the gums and the dorsum and edges of the tongue, and other places. There appears, sharply outlined, whitish or silver colored points, streaks, bands, or patches of irregular shape, either flattened or slightly elevated above the level of the general mucosa. Ordinarily they simply present a roughened surface without much discomfort. They occur almost exclusively in the mouths of men who are excessive smokers. The condition, however, should not be mistaken for that which is frequently seen in the mouth of excessive smokers, especially pipe smokers, where there is a whitening of extensive areas of the tongue or hard palate or both. The epithelium of the smoker's tongue is of a brownish-white, while in leucoplakia the patches are of a clear white color and are very characteristic, no other condition of the mouth presents the same clinical picture.

Leucoplakia lesions are painless and may be overlooked by the patient unless they become complicated with cancer. It has been observed that carcinoma frequently has its beginning in the site of an old leucoplakia patch. Since this is true an early diagnosis should be made, which is clearly within the province of the dentist who may note it before the patient. The patient should be advised to avoid all irritants, especially tobacco and alcohol, prophylaxis should be instituted and soothing mouth washes prescribed. The treatment of the disease itself should be relegated to the oral specialist or family physician. In cases of known syphilis the anti-syphilitic treatment would be indicated.

ACTINOMYCOSIS.

This disease is common among the lower animals, especially cattle, and is known as lumpy-jaw. The disease affects the lower jaw and cervical glands, and cases in the human being have been reported by Brophy, Bevan, Zederbaum, and others. It is due to an infection with the ray-fungus, which is normally found in grain and is supposed to find its way into the mouth from the habit of chewing on straws. The germ probably gains admittance into the tissues from the mouth through decayed teeth. Blair states that, "the disease first manifests itself in the form of a small nodule, which for a time may give no trouble, but later softens and forms sinuses from which is discharged a thin fluid which usually contains the fungus." The microscope affords a positive means of diagnosis.

The treatment of the disease had better be carried on by the medical specialist, as it is so rare in the human being that dentists but seldom see the condition. Based on observations made at the Wisconsin Experimental Agricultural Station, Beven introduced the copper sulphate treatment in man, and both he and Brophy report good results by using the drug to the limit of toleration. They begin with about $\frac{1}{4}$ grain given three times a day, gradually increasing the dose to one grain. In addition to the internal administration of copper sulphate, irrigations of a 1 per cent solution are also employed.

I shall not discuss here the disease commonly called pyorrhea alveolaris for two reasons: First, this disease, while it affects the supporting structures of the teeth, is more directly associated with the teeth proper than most of the diseases I have considered; and secondly, to discuss pyorrhea in its various details would occupy an evening by itself.

In this paper I have endeavored to emphasize the necessity of the dentist being on the out-look for these various diseases of the soft tissues of the mouth, which, in my opinion, have not been discussed in dental literature as much as their significance merits; and, consequently, dentists, as a rule, are not as familiar with their manifestations as they should be. We should all delve more deeply into the science of pathology, and then learning to interpret the clinical symptoms of these lesions we can apply our treatment or advise our patients intelligently. Surely this is not too much to expect of the trained dental practitioner of today.

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ORAL MANIFESTATIONS OF SYSTEMIC DISEASE.*

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The pathologic and clinical pictures of disease conditions of the oral cavity present many and different aspects. I take it that congenital defects and deformities, of interest, perhaps, to the oral surgeon and orthodontist, have no place in this paper. Nor shall I attempt in any way to discuss diseases of the teeth, as that is your business, not mine, and I know nothing of the subject. My purpose is to bring out in a general way the bearing of certain lesions of the mouth, and adjacent cavities visible through the mouth, that should be of interest and a knowledge of which would be of value to the dentist, both for his own protection and that of his clientele.

Lesions of the oral cavity (using the term in a broad sense) may and in most cases are but local symptoms of a general or systemic condition, the primary trouble being elsewhere; though we also have troubles of a general nature or having general systemic physiologic manifestations, the primary, or at least the earliest symptom of which occurs in the mouth.

Neoplasms of various kinds occur on all parts of the oral cavity, in the case of any tumors, if not inflammatory, the diagnosis must be most carefully considered, because, even if the possessor's life is not at stake the diagnosis of tumor means an operation of a more or less serious or disfiguring nature. Briefly, the points to be considered are the place of origin of the tumor, is it epithelial or of supporting tissue, thus distinguishing between the epithelemata, the Sarcomata, fibromata and osteomata. If on the lip, tongue or tonsil, more likely it is an epithelioma than any of the latter tumors, and if of gums is it an epulis? If of the bones is it a cyst or due to some sinus trouble, or if of the rear of the tongue it may be a hypertrophied lingual tonsil, or if under the tip of the tongue a ranula, etc. None of these conditions are in any way transmissible either by the operator or the patient and I propose in this paper to consider briefly only those diseases the dentist is in danger of contracting from his patient or transmitting to them.

*Read before the St. Paul District Dental Society, November 19, 1913.

Of the general diseases having buccal lesions the exanthemata are perhaps the most important and the granulomata next in importance, though diphtheria is of great importance, and while I expect to say it later, I shall say it now that syphilis is of the utmost importance and I have no doubt more syphilitics sit in your operating chairs than patients with all the other troubles combined, as syphilis is always with us, and while the others are also, the sufferers are in most instances too ill for dental work.

The eruptions of smallpox, chickenpox and German measles (the last particularly on the soft palate) occur on the mucous membranes of the mouth, as well as on the skin, but the physician has the advantage of the dentist in that he can look the patient over more extensively. The spots described by Koplik in 1896 appear on the mucous membranes of the cheeks, inner side of lips and gums sometimes as early as 72 hours before the cutaneous eruption of measles, and while of great importance in making an early diagnosis perhaps they are of little importance to the dentist, because 85% of the population acquire measles prior to their tenth year, therefore but a very small percentage of your clientele will be susceptible. Of course, a second infection with measles is not uncommon, but it is the exception rather than the rule. The modern idea, however, is that measles is only transmissible the first few days of the disease and while this may be a fact one must remember that measles is perhaps the most contagious (if I may use the word) of all exanthemata. Whooping cough is a good second to measles in this respect and I mention it here because small ulcers of the mouth are not uncommon in this disease, and of course the pharynx would show some inflammation. As a matter of fact any acute febrile condition usually shows some pharyngeal symptoms and a coated tongue. Scarlet fever, as you know, is accompanied and almost invariably ushered in by an angina, the patient first complaining of nausea, sore throat and perhaps a chill. The diagnosis of scarlet fever, however, too often is an exceedingly difficult matter as the disease may run a mild course and the angina is in no way typical, the peculiar strawberry tongue of scarlet fever is rather characteristic, however, and an angina, strawberry tongue, chill, fever, nausea and the rash make the diagnosis easy. The contagion of *Scarlitina* perhaps is carried

entirely by the respiratory secretions and exhalations and secretions of the mucous membranes of the mouth. Some authors claim that the contagion of smallpox and chickenpox may be carried in a similar manner. It must seldom happen, however, that a scarlitina patient visits the dentist's office.

This cannot be said as to diphtheria, particularly since we know that many throats harbor the *B. diphtheriae* when the carrier suffers little or no inconvenience. These are the cases largely responsible for the transference of the disease and the same may also be said of the mild case of scarlitina. A typical diphtheritic tonsillar membrane as a rule presents no difficulty of diagnosis, but the mild case does, and physicians have long since learned that the cultural test is the only sure diagnostic procedure.

In making the diagnosis of diphtheria, follicular and mycotic tonsilitis, syphilis, Vincents augina and scarlet fever must be eliminated. The dentist working as he does with his fingers in the mouth and his face close to that of his patient runs considerable danger of contracting these diseases himself as well as carrying them to subsequent patients. About 17% of scarlet fever patients also have diphtheria. Tuberculosis occurs in the mouth as elsewhere, but is rarely primary except on the tonsil. Ulcers of the mouth and pharynx had better be considered as syphilitic till syphilis is eliminated. Actinomycosis and leprosy also occur in the mouth, but are hardly of enough importance to mention. It is known that the virus of Poliomyelitis or infantile paralysis is found on the pharyngeal mucous membrane and that the saliva of a rabid patient contains the virus of hydrophobia. All the above diseases are transmissible in various ways.

It must also be remembered that the mouth offers great possibilities for infection and that the oral mucous membranes teem with germs of many kinds and that hardly a pathogenic or saprophitic germ exists that has not at some time been found on the mucous membrane of the mouth and may be transmitted from patient to patient by means of unclean instruments or hands. This danger is a real danger and while familiarity breeds contempt as to details, one doing surgery must cultivate aseptic technique until it becomes instinctive and even then the

surgeon by taking thought can easily think of some little thing that would be an improvement. You will notice I did not say dentist, but surgeon. Many persons are indifferent to social cleanliness, and find it difficult, and as our professions are recruited from all classes of people it is no wonder that surgical cleanliness is a difficult art to master. Instruments must be sterile or at least contaminated only by the oral secretions of the particular patient operated upon, and when not held in the hand they must be laid down where they are not contaminated by touching the table where instruments used on a previous patient have touched. I am under the impression that the last rule of asepsis is more often violated than that requiring clean instruments, or at least that the harm done is greater from this than the former.

It occurs to me also that two faults of technic are often made, the mirror is not sterile. For a small sum in excess of the ordinary price a mirror capable of being boiled can be purchased; at least the nose and throat specialists can buy them. Another source of infection, I believe, also to be the small paper box with the red cross slits in its top and a red cross on its sides where the pellets of waste cotton are placed. Every time the forceps are thrust through its top they are contaminated by the septic material thrust through previously.

There are other conditions of which the lesions may occur in the mouth than those mentioned. I have seen the lesions of acute pemphigus, erythema multiforme, toxic eruptions, herpes and urticaria, leucoplakia or smokers' patches, constituting the so-called psoriasis of the tongue, geographical tongue, etc. The lesions often stinking and necrotic produced by mercurial intoxication, slight thickening of the mucous membranes of the cheek and excoriations of the tongue due to sharp carious or irregular teeth, and small adenomata of the tongue due to the same cause. I myself have never seen lichen planus or erythematous lupus of the mucous membrane though both occur here. Bleeding of the gums occurs in scurvy and leukaemic as well as in pyorrhea. Small aphthous ulcers are of frequent occurrence and are of no importance. Gonorrhoea, chancroid and vaccinia have also occurred in the mouth. Arsenic saturation causes a garlicky breath and phosphorous poisoning necrosis of the lower jaw and

the blue gums of lead poisoning are described in every text book on toxicology and sometimes seen.

SYPHILIS OF THE MOUTH.

Syphilitic lesions of the mouth are exceedingly common and as a rule present little difficulty in diagnosis. I speak now more especially from the physician's viewpoint, because we can usually look over our patients from head to toe and obtain a history of the trouble bearing on the conditions as found. Such is often impossible for the dentist. Our patients also consult us for lesions of the mouth or other troubles, while yours presumably only for their teeth and no doubt many of them would resent much questioning.

Almost all syphilitics during the first few months of their disease present lesions of the mucous membranes of the mouth. Early syphilis is a disease of the tissues derived from the embryonic ectoderm and the mucous membranes of the mouth are derived from this embryonic layer. Again the mouth is a hotbed of infection, is much subject to irritation and trauma and therefore offers by a lowered resistance a favorable site for the outbreak of the syphilitic poison. The mucous patch is nothing more than the manifestation in the mouth of the syphilide as found on the skin and differs from it only in that being located on a moist and warm surface it is never crusted and furthermore is more often an open lesion, its surface being easily macerated because of its situation. Because of its macerated and open condition the mucous patch ranks with the primary lesion as the most virulent lesion of syphilis. The mucous patch is most often simply a more or less irregular erosion of the mucous membrane and may occur any place in the oral cavity, except on the teeth themselves. A dirty mouth, pyorrhea, carious teeth, irritation of hot food, tobacco and alcohol aggravate the condition, often they show a slight ulceration and are frequently covered with a pseudomembrane, being the degenerating epithelium, and very often they occur only as a slightly thickened scaly patch. They are almost always multiple and found in different parts of the mouth. Those on the tongue differ somewhat from those of the cheek, tonsils, soft palate and lips, in that the mucous membrane of the tongue is closely adherent to that organ. Here the

mucous patch is a smooth patch the papillae being destroyed or else the tongue is fissured, often in a stellate manner. In this last case the lesion is apt to be quite painful, especially towards the edges of the tongue where most likely it is ulcerated as well. The so-called syphilitic angina when accompanied by mucous patches is diagnostic of the disease without looking further. The scaly patch, however, must be differentiated from the smoker's patch and the ulcerative patches from simple aphthous ulcers or "stomach ulcers" and the fissured tongue from a congenital condition resembling it, leucoplakia and other conditions. The lesions caused by mercurial stomatitis as well as other forms of stomatitis greatly resemble the syphilitic lesions. French writers claim that leucoplakia is always of syphilitic origin. German writers deny this. A syphilitic erythema also occurs on the mucous membranes of the mouth.

The syphilitic virus enters the system presumably through some solution of continuity of the epithelial covering, and wherever it enters that site shows the first evidence of the disease and the sore produced there is called the primary lesion, primary sclerosis, hard chancre, Hunterian chancre, chancre, or initial lesion, to give its various names. (I do not intend to take up congenitally acquired syphilis.) This initial lesion does not appear for some time after infection takes place, usually about three weeks, rarely a shorter time, but more often longer. It may be but a mere erosion, excoriation, or crack, or may develop into an ulcer, it is usually very indolent as to healing, generally, almost invariably indurated, non-painful and secretes serum rather than pus, unless there is a pyogenic infection also, the two frequently occurring in the same site. In about 75% of instances the lesion is a single one. Some four weeks more or less after the appearance of the chancre the outbreak of syphilides of the skin and mucous membranes appear, this has been called Secondary Syphilis. This outbreak is generalized, symmetrical in distribution and involves the superficial structures. Later still the lesions become localized, tend to involve the organs of the body and the supporting tissues and to become localized. These are called gummata and this stage of the disease has been designated tertiary syphilis. Locomotor ataxia and paresis are sometimes called parasyphilis or deuterisyphilis,

though these two terms must now, in the light of recent discoveries be discarded.

The above in brief is a typical outline of the course of the disease, but there are many exceptions. Furthermore, no disease presents as varied pictures as syphilis, and syphilis may also stimulate almost any other disease.

I took the liberty of going into the above briefly because lesions at all stages or periods of the disease or at any time from the beginning of the disease to the patient's death, no matter how many years later after infection, may occur in the mouth.

In the light of recent research also we are forced to admit that any syphilitic lesion, no matter how late in the disease it occurs carries the virus and is capable of transmitting it, if the virus chances to light upon a favorable situation. However, transmission from lesions involving the supporting tissues or tertiary lesions if you like, is much less apt to occur than from lesions of the epithelial covering or from those called secondary lesions.

Syphilis is not necessarily a venereal disease, and about 8 or 9% of infections take place on sites other than the genital organs, the great majority of such infections are innocently acquired. Fournier statistics show that he had observed 1,124 extragenital primary lesions. Of these 849 or 75% occurred on the head, and of these 849, 567 of them were upon the lip, 75 on the tongue, 69 on the tonsils, 11 on the gums and 1 on the mucous membrane of the cheek. I give these figures to show what a large part the oral cavity plays in syphilis. I have already stated the frequency of secondary syphilis of the mouth. I presume also, though I have no figures at hand, that tertiary syphilis of the mouth is about as common as primary syphilis, perhaps more common.

Now, in my own practice since I have been paying particular attention to this and similar diseases I have seen innumerable patients presenting mucous patches of the mouth and its adnexia. Many presenting tertiary lesions of the mouth, pharynx and hard palate, etc., such as deep ulcers, gumma, perforated palate, ulceration of palate, etc.

Condylomata, warty growths or syphilitic papilloma, I have

seen but once in the mouth and that time on the under surface of the tongue. Of primary lesions of the mouth, I have seen one of the tonsil (not in my own practice, however), two on the tongue, six of the lips (four lower and two upper) and one of the gums. How were these ten infections acquired? Some perhaps were due to unnatural practices, though no history of such practices were obtained. Two of the lip chancres were acquired by kissing and the chancre of the gum, to my mind, could only have been acquired in one way—but I shall not say that—but that is the most plausible explanation—by a dentist's instrument. While I was careful not to mention to the child's parents my surmise, they had come to the same conclusion as myself after having been told what the trouble was and thinking things over. It was located on the gum about a cervical filling of one of the front upper teeth and was apparent about four weeks after the dental work was done and had been present two weeks when I first saw it. There was also a chancre of the middle of the upper lip. The diagnosis clinically was undoubted and was confirmed by the find of the *T. pallidum* (*S. pallida*) in both chancres. A Wassermann test was not made as it was considered unnecessary and the parents were satisfied as to the diagnosis and did not care to go to the extra expense.

I am glad to state that I do not know who the dentist was, as neither the child or the child's mother volunteered the information and I never asked, because I did not care to have them think I thought anything about it. Now, I do not relate the history of this patient in criticism of your specialty of medicine, but because it happened in my own experience. Many such cases can be collected from a perusal of medical and dental literature. I will say, however, that I have never treated but one dentist for syphilis, although I have treated a good many physicians for the disease. Some of them contracted their disease in the orthodox manner and others had their initial lesion on the fingers, infected themselves by their own carelessness. One patient had the chancre located in the nose, evidently the infection was carried there by his own fingers or perhaps by a patient with syphilitic tonsils coughing in his face as he had been treating locally such a patient. I have seen other instances of the disease having been inoculated by lesions of the mucous

membrane of the mouth. I have seen two chancres, one of the shoulder and one of the breast, both of these patients had been bitten there—evidently the biter had lesions in the mouth. Also another chancre of the breast, where no history as to the source of infection was obtainable.

From the foregoing you will see that the mouth is a potent factor in the transmission and reception of syphilis and extragenital and innocently acquired syphilis is much more common than one not treating these patients would believe.

It seems to me that the public cigar cutter must be a very potent factor in the transmission of innocently acquired syphilis. How often do we see a man buy a cigar, moisten it in his mouth and then thrust it into the cigar cutter. Perhaps he has a mucous patch on his lips or mouth and prepares the cigar cutter so that the next user may acquire the disease or perhaps his predecessor prepared it for him. Instances of medical men having infected their patients by means of dirty hands, instruments, dressings, etc. can be easily collected in medical journals.

Syphilis of the mouth is really of more danger to the dentist and his patients than any of the other diseases liable to be so transmitted, because syphilitic patients are for a long time capable of transmitting the infection, and the lesions are often so slight that they are overlooked. Syphilitic patients are not too ill to be kept from having their teeth repaired and about the last thing a syphilitic patient does is to tell anyone he has or has had the disease.

Perhaps, you may say, "I don't have any syphilitic patients." Now, don't be foolish enough to believe that, no matter how respectable your clientele may be, because syphilis is as common among the well to do as the poor, and it is common enough among all classes—you meet it in your office, at your club and lodge room, at church and social gatherings. Many men may have it and have no idea when and how they contracted it, very few women know anything about it, and in only about 50 per cent of them is there any history of infection.

THE RELATION OF FOCAL INFECTIONS IN THE
MOUTH TO SYSTEMIC DISEASES, ES-
PECIALLY ARTHRITIS.*

BY T. W. STUMM, M. D., ST. PAUL, MINN.

We, who are practicing dentistry and medicine today, are working under entirely different environments to our forefathers. I dare say there are members of you here this evening, who in your earlier days of practice, never thought of such a thing as inviting a physician to address you on a subject concerning both the dentist and the physician. And, on the other hand, it would probably have been just as much unheard of to ask a dentist to address a body of medical men. Yet, to-day, it is not an uncommon occurrence at all to find a man of one of these professions addressing those of the other. There must have been some very radical changes in both professions to account for such a change as this. This is an age of advancement, and we who are practicing either dentistry or medicine today, are doing so under entirely different environments, and doing things from materially different standpoints from men who practiced fifty years ago. If a man today will look through the old time medical books of our predecessors, he will find the advances that have been made along general medical lines so enormous that it is hardly possible for us of the younger generation to understand on what basis their views were founded.

When asked by one of the members of your profession to say something to you this evening on a subject that is closely related to both the dentist and the physician, I was only too glad to do so; for we both, as dentist and physician, know today that there are a great many diseases which, considered in their entirety, concern the one probably as much as the other. It is not at all uncommon that patients are seen who, by the combined efforts of the dentist and the physician, receive much better care than it would be possible to give by either one alone. During the last few months this point has been especially impressed upon my mind owing to some diseased conditions in which it was very apparent that the general condition was closely associated with a focal beginning in the mouth.

There is one of your number present here this evening who has

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been somewhat of a pioneer in the profession of dentistry relative to the part played by infections about the teeth as a disease entity. I refer to the work Dr. Hartzell has been doing for several years on pyorrhea alveolaris. There are other members here and there in the dental profession who have laid special stress on some *one line* of dental work, and have been great factors in connecting the chain of the work done by the dentist and the physician. Such men as Brophy, Talbot and Black have taken the broad view of dentistry in general and have been of great value to both the dental and medical men.

While the infections that occur as pyorrhea, dental caries, and abscesses of the teeth are common, everyday subjects of treatment, it is probably not generally recognized by either the dentist or the physician as it should be, that these conditions are frequently a connecting link between infections beginning locally in the mouth, and such as occur not infrequently as the starting point in general systemic diseases. Diseases of the body sometimes occur only as a focal condition, but how frequently it is seen the focal condition is only the beginning, or starting point, of a general systemic disease.

There are regions of our anatomy so located that it is not infrequent local infections around the teeth are of easy access to some other important part of our anatomy. One of the common local infections that is probably most often associated with an infection of a diseased tooth, is the antrum of Highmore. This association is not always present, yet in no small percentage of cases is such a connection to be found, and probably forms one of the closest connecting links between the work of the dentist and that of the medical man. It is such an apparent connection of the two conditions as this that has doubtless led to a more general study, and a wider conception, of the connection that exists between infections about the teeth and general constitutional diseases.

The varieties of bacteria that exist in and around the teeth are so numerous that it would be difficult to enumerate them—at least to do so with accuracy. A great many of these bacteria are entirely harmless, or at least harmless under ordinary conditions such as that in which they exist. Others, such as the staphylococci, streptococci and pneumococci, are especially frequent in the mouth, and not uncommonly associated with some general diseases that may occur either widespread, or more or less locally. Some of the

bacteria just mentioned may occur as comparatively harmless organisms, so far as their virulence is concerned in the mouth, but when transported to some other part of the body, growing under different cultural environments, the whole nature of the organism may change, and, as a result produce an organism that is entirely different from its action as the excitant of the local infection around the tooth. The pneumococcus is one of the best examples of such an organism. It has been shown very definitely that this organism is capable of producing entirely different pathologic changes under different environments of growth, and when it is transported from a local infection, such as frequently occurs in the mouth, to some other part of the body where its cultural environments are materially changed, it can, and often does, produce an organism whose virulence is entirely different from what it was in its original location. It sometimes seems to change a good many of its morphological characteristics, though retaining enough so that it can still be recognized and placed in its original group.

The saliva coming in contact with the various organisms that occur in an infected mouth is frequently very materially changed in its ability to act as a digestant, and this is probably one of the first pathologic systemic conditions that is met with in such mouth infections. Through the saliva myriads of bacteria may be carried from the oral cavity to the stomach. During the process of digestion the normal stomach secretes hydrochloric acid in such quantities that the growth of the bacteria is entirely inhibited, or very materially altered, yet with a normal amount of hydrochloric acid secretion, it is entirely probable that a certain amount of pathogenic bacteria may pass with the acid content of the stomach into the intestinal canal where the reaction is different, and often favorable to their growth. While many of the bacteria that are encountered in the mouth are not of a nature that a further growth will at all interfere with the general mechanism of the system, some, in fact, being beneficial in the way of cleavage in the digestion of certain foods, others, though perhaps less in number, are decidedly detrimental in the general functional mechanism of the system, and it is in the latter class that a connecting link between focal infection in the mouth and general constitutional conditions relative to the gastro-intestinal tract are concerned. Then again, we must remember that not infrequently the secretions in the

stomach itself are not such that the acid content of the gastric juice will inhibit, even to a small extent, the growth of pathogenic organisms; in fact, we frequently find patients whose gastric secretion contains no hydrochloric acid at all, and in such cases as these it is entirely possible, in fact, probable, that this condition may aid very materially the production and growth of the organisms.

There is some question as to just what changes may be produced in the gastro intestinal tract by the ingestion of these pathologic bacteria. It is only fair and reasonable to assume, however, that in many cases a very material role is played, and that not a few pathologic conditions may develop from it. Some men take a decidedly radical view and are inclined to think that such pathologic germs may do a great deal of harm to the general organism. To me it would seem that such a radical view is rather extreme, but I do think that the constant ingestion of such organisms often plays a very material role in gastro-intestinal diseases.

The gums and the alveolar processes in such infected mouths are always far from normal and undoubtedly offer a most inviting channel of entrance for whatever pathologic germs may be present. How frequently we see regional glandular infections in such cases. Once the organism is so located, the circulatory system of the body is such that the further conveyance of the organism is an easy matter. While the glands are able to destroy some of the bacteria, it is not at all probable that they usually destroy all of them. The lymphatic glands are in direct communication with the circulatory system of the whole body, and once passing into the general circulation, it is frequently difficult to say where or in what organs the infection may become localized.

We know today that organisms circulating in the blood is not nearly as infrequent as it was formerly supposed, though in a great many instances certain white blood corpuscles are entirely able to look after the bacteria and render them innocuous or entirely destroy them. These are the phagocytes—white blood corpuscles—whose role it is to act as scavengers which may partially or entirely destroy the invading organisms. At any rate, such cells are very energetic and constantly on the alert for such a function. It is just here that we are bordering on an enormous subject—that of immunity—one which leads us into “deep water” and is somewhat foreign to our discussion in this subject. There may, however, be

more of the organisms circulating in the blood than the phagocytes are able to destroy, and, in such cases, we have to do with a more or less widespread infection that not infrequently becomes localized in some remote organ of the body where there is a more favorable environment for their further production and pathologic action.

We are accustomed to refer to the growth of these organisms in the blood as septicemia. Such a condition occurs in various grades of intensity; sometime so mild that the general metabolism of the body is not materially interfered with, and again, of such severity that death may result in a short time. It is in the cases that are borderline between these two extremes that the general discussion is concerned with. Among the organs that are frequently involved in such a bacterial growth, the heart is one of the most common. This frequently manifests itself by a condition known to us as endocarditis and among the sources that may furnish the germs for such a condition, the infected teeth must be considered. While such a source of infection is not the most frequent, it is one of the locations from which the infecting organisms may originate, and must be borne in mind, for in most cases endocarditis is of an infectious origin, the germs having been transported through the medium of the blood. Frequently, after such an inflammatory attack, the valve is very materially damaged from an anatomic standpoint and, not uncommonly, later in life invading organisms circulating in the blood find a point of "less resistance" and become localized here, this forming a new depot of septic growth. Such a condition as I refer to is known clinically as "septic endocarditis."

The muscle tissue itself is a very common point of localization for such invading organisms. The distribution may be comparatively local or widespread, the resulting damage largely depending upon the nature of the organism and the extent of its distribution in the muscular tissue.

The kidney is another organ that not so very infrequently is called upon to bear a part, or all, of the damage done by these circulating bacteria. I recall a patient whom I saw about two years ago with a very marked parenchymatous nephritis that was apparently associated with badly infected teeth. In this case all of the teeth were extracted owing to the severe kidney condition.

Almost immediately afterwards the urinary findings began to improve, as well as the man's general condition. He was in very bad shape when the extraction was done and it was thought for a time that the improvement was such that he would probably recover, though after lingering along for some time, much improved at first, the condition proved fatal.

Other conditions in the kidneys than nephritis may be associated with some focal infection that is far removed from the origin. Localized abscesses are probably the next most frequent, if not quite as common as nephritis.

Amyloid degeneration is usually associated with some chronic pus producing process in some part of the body, the effects manifesting themselves frequently far removed from the original infection; the kidney, spleen and liver being the organs that usually suffer from such a degeneration. There is no reason why a chronic infective process around the teeth may not be able to produce this change.

Osteomyelitis is very often associated with a suppurating focus far removed from the bone lesion. This focus may also be found in the mouth.

Another large and very important pathologic field that is not at all of infrequent occurrence is the effect of infectious conditions in the mouth to the blood itself. As we have noted earlier in this discussion the organisms are very frequently absorbed into the blood, the absorption often being a constant one of long duration. While certain cells in the blood are able to combat more or less effectively with this infection, it is only natural to assume that after a prolonged period of time the action upon the blood must be more or less detrimental. This is often characterized by a simple anemia. Frequently when this impoverished condition of the blood has kept up for a long time, it reaches such a grade that the nourishing qualities are very materially impaired and the general nutrition of the body suffers in consequence. How often we see a patient with a chronic mouth infection whose general nutrition is far below par, or in some cases it is just possible that the morphologic characteristics of the blood itself may undergo certain changes.

There is some question as to such infectious processes being able to produce a typical picture of pernicious anemia. We do not know just what the cause of this blood picture is, but we do know

that it is not so very uncommon to find a typical picture of pernicious anemia in patients who are suffering from a chronic infectious process in the mouth, or some of the accessory sinuses.

Some very striking examples of this have been seen by me during the past summer. In one, a comparatively young man was suffering from a very grave form of this blood disease. Two abscessed teeth were discovered; in one of them the infection had broken through into the antrum causing a long standing, low grade suppuration. In another, a man past middle age, there was one of the most marked cases of pyorrhea that I have seen. The gums were soft and pulpy and pus was oozing from around all the teeth that were present. This patient was in a very low state of nutrition, with an extremely marked grade of anemia, presenting in every way a perfectly typical blood picture of pernicious anemia. One of the things that I did in a therapeutic way was to have all of his teeth extracted, not deeming it advisable, in his physical condition, to temporize with treatment of the mouth condition. He was then put upon such treatment as is frequently used with more or less success in such cases. His general feeling of well being began to improve almost at once, and while I do not know just what his blood picture shows at the present time, I am informed that he has very materially improved in every way. The appetite, which was practically nil before, is now very good indeed. While such examples, many more of which might be mentioned in this connection, do not definitely prove that chronic suppurative conditions in the mouth are the direct cause of pernicious anemia, the relationship cannot be lightly ignored, and, in my mind, it is strongly presumptive that it at least plays a role in the etiology.

Probably the most important relationship that exists between focal infections in the mouth and diseased conditions in some other parts of the body, is that of arthritis. Today we look upon practically all non-traumatic forms of arthritis as infectious processes. It has been recognized for a long time that a great many of these joint manifestations were infectious in nature, but, as time goes on, more and more of them are gradually placed in the infectious, and today even arthritis deformans, which in the past has been considered as some constitutional disease, the causation of which has been a mooted question, is now quite generally

looked upon as a chronic infectious condition, and it is not at all improbable that these mouth infections furnish their share of exciting foci.

In not a few cases of chronic joint involvement of various natures, the relationship between the mouth infection and the joint condition can scarcely be doubted. My association with some of your profession in such joint conditions is doubtless responsible for my having been asked to present this paper before you this evening. Time does not permit, in this discussion, our going into the details of the various pathologic phases that occur in more or less widespread joint involvement; neither would it be profitable. If the fact can be more firmly established in the minds of dentists that such joint involvements are frequently secondary to the work that you are doing every day, it suffices. Only a day or two ago a patient who has had a chronic joint involvement for a long time, this to my mind directly associated with infected teeth, remarked to me, "Is it not rather surprising that the relationship of a mouth infection to chronic joint involvement is not more generally recognized than it is?" I told her that I did not think so; that this relationship is one that even yet has not received the widespread recognition that it should, and that it is only comparatively recent that such an association is becoming more firmly grounded. I have no doubt, however, that the time is not far distant when both the medical and dental students will be taught that there are a great many local and constitutional diseases that are secondary to mouth infections. In fact, such is taught today, but it is in a very general, disconnected sort of way, and it does not appear to me that there is nearly as much stress laid upon it as there should be.

This by no means covers the field of the entire relationship between focal infections in the mouth and constitutional or local diseases. I think, however, it is enough to convince you, as dentists, that you are dealing with a subject of great importance when you are treating focal infections, as you are constantly doing. It is generally recognized that so-called team-work accomplishes the most for our patients in general. This, of course, is not always true, but the fact that today so many men are giving special attention to some localized field proves to me that the human body is such a complex mechanism that it is hard—in fact, impossible,

for one man to properly master the whole of it. While we should have as broad, general understanding as possible of the whole body, men who are devoting special study in some parts or conditions, undoubtedly become more efficient, and are able to render better judgment in their select fields of work, and, not infrequently, the physician who recognizes a focal infection in the mouth can receive material aid from the dentist; and on the other hand, it is well for the dentist to recognize that a focal infection in the mouth may be the starting point of some general constitutional condition, thus giving him a broader conception of the work that he has in hand.

DISCUSSION.

E. S. GEIST, M. D., Minneapolis, Minn.:

I am very grateful that I was present this evening to hear the able exposition just given by Dr. Stumm. I wish to thank the Society for this opportunity.

The doctor has covered the field briefly, but so ably that there remains little to add. The subject of focal infections as they affect distant regions of the body is just in its infancy and none of us know how far our present conception of disease may be altered in the next few years.

. Tonight we are really dealing with the subject of metastasis. The point which is often difficult for the patient and, sometimes even for the physician, to understand is that the distance of the original atrium from the region complained of is so great. This, of course, is of no consequence. Enough is known of the subject of metastasis at the present day so no one should utter surprise to hear of a case where the original focus is, for instance, situated in the middle ear and the secondary disease complained of is an osteomyelitis of, for instance, a bone of the foot. We know that it is by the blood stream that these pathologic organisms find their way to distant regions of the body. However, it is a difficult matter to find these organisms in the blood in every case, much depending upon the element of chance as well as on the expertness of the investigator.

In my special field of work, that of diseases of the bones and joints, it is my province to see a great deal of metastatic infection, both of the acute and chronic types, and consequently,

I have had considerable dealing with all varieties of dentists in the care of the cases. I have met with dentists who see in the mouth the only possible portal of entry for the offending organisms—an extremist standpoint. On the other hand, I have met with dentists who do not seem to know that such a subject is even being talked about. Further, I have met with that type of dentist who believes that in the mouth we have frequent source of disease, but is unable to find the source. It seems that while, as a rule, an infectious focus in the mouth is easily discernible, it may, on the other hand, be extremely difficult to locate the atrium of disease in some given case. More than once, it has been my experience to have teeth located and clinically proven to be the original focus of disease which have never given a symptom and which teeth, to all outward appearances, were normal.

I would caution you to use all diagnostic means at your command, including the X-ray, before reporting back to the physician in charge that "the teeth are all right."

The physician realizes, however, that the mouth is not the only possible source of infection. It is important to remember nevertheless that in the mouth are to be found the most easily accessible foci of infection; therefore, the greatest amount of attention is being paid to the mouth. And this is as it should be at the present time.

A point not brought out by Dr. Stumm's paper quite as fully as I should like to have seen it, is that there are many other possible original foci of disease. It is, of course, up to us physicians to locate these possible foci, and what I would like to impress upon you this evening is the fact that before looking for any of these other foci, we practitioners of medicine must have an authentic, negative report as far as the teeth and mouth are concerned. We must know and feel sure that the teeth are not to blame before we search for other foci.

Several times it has been my experience to have a dentist issue a clean bill of health as far as the teeth were concerned, only to find later that he, for some reason or another, was mistaken. Therefore, I should urge upon you the necessity of using every possible means of diagnosis at your command before arriving at a conclusion as to the state of the teeth.

To my mind, the chief point of value in the doctor's paper is

that he has pointed out the fact that all of our specialties fuse and merge with one another on all sides; that it would, indeed, be a sorry "internist" who would not avail himself of the help to be derived from the dentist; that it would be a sorry orthopedist who could only see the diseased knee, or ankle joint, and forget the original atrium of disease as it is situated in the mouth or elsewhere and so on.

IMMUNITY.*

BY P. J. KESTER, D. D. S., CHICAGO, ILL.

In attempting to discuss this subject of immunity we are quite sensible to our inability to do it justice. But the study of immunity is the logical sequence to the study of bacteriology. The world wide study of preventive medicine is based on the study of immunity. Rosenau, says "Immunity or resistance to disease is the very foundation of preventive medicine. It is the overshadowing factor in hygiene."

In this sense we use the term hygiene to include the care of the person, in contradistinction to sanitation which deals with the environment. There is no sharp line of demarcation, we speak of hygiene of teeth, of sleep, of bathing, of food, etc.

And we speak of the sanitation of the home, schools, cities, etc.

He says sanitation is impersonal, hygiene personal and as far as the prevention of disease is concerned one of the most important factors in hygiene is immunity.

The great achievement in medical science of today is the wonderful advance made in the study of preventive medicine, and we dentists have a great responsibility placed upon us when we are expected to guard the very portals of the body against the invasion of destructive and infectious bacteria. That the mouth seems at first glance to be an ideal place for the culture of germs of all kinds is apparent. It has warmth, moisture and food elements, yet of the millions of bacteria that enter the mouth very few of them are taken up by the system, or if taken are harmful,

*Read before the Odontological Society of Chicago.

because something in the fluids of the mouth has rendered them harmless.

We may not enter into a lengthy discussion of the Theories of Immunity.

Pasteur is justly given credit for the earliest scientific explanation of the facts of recovery from, and subsequent immunity to infectious diseases. His theory was known as the *exhaustive* theory—a certain amount of food being necessary for each bacterium, and when the total amount contained in a given solution is used up the growth of the bacteria must cease.

The *retention* theory of Chauveau followed. This was based on the fact that organisms were destroyed by their own waste products.

The above theories are based on chemical action, while the later theories are based on the action of the living elements of the body, phagocytosis, Ehrlich side chain and antibodies, theories, etc. Rosenau says, "The mechanism of immunity in some instances reside mainly in the blood and fluids, in other cases it is evidently more directly *associated with cellular activity*. May I be pardoned for a slight digression at this point? I desire to call attention briefly to a paper by Prof. Victor C. Vaughan of Ann Arbor (Journal American Med. Assn. of May 15, 1913) entitled Protein Poison in relation to Disease.

One of the first suggestions made which jars our previous views on bacteria is that which places them in the animal rather than the vegetable organisms, as we have been taught to believe, and again of his simple explanation of the action of the bacterium, and incidentally to indicate the mode of action in immunity.

"Bacteria have generally been regarded as unicellular plant organisms, this view is without warrant.

"There is no proof that the bacterial cell contains cellulose, indeed all the evidence that we have concerning the chemistry of the bacterial cell is quite the contrary.

"The bacteria that have been most thoroughly studied, consist largely if not wholly of nucleoproteins or glyco-nucleo-proteins, and are therefore more closely related to animal than to the vegetable forms of life. Bacterial cell substance yields the nuclein bases and the greater part of it consists of protein, as is shown by

its abundant yield of amino acids both amino diamino. Bacterial cell substance is chemically complex and highly organized. This means that functionally they are quite on a par with the cells of the animal body with which the pathogenic bacteria so often compete.

"The new theory of how bacteria cause disease may be stated as follows: The cell is the morphological unit of life though not the physiological unit. The latter is the protein molecule which lies in the cell and of which the cell is essentially composed. The only essential and constant distinction between living and dead matter is, that the former is never in a state of equilibrium, it is essentially absorbing and excreting its feeds and eliminates it is constantly trading in energy, it is labile not stable. Every living cell must form ferments by which it splits up the pabulum on which it lives whether a given bacterium is pathogenic to a given animal or not depends on two things "

"First in order to be pathogenic it must be able to split up and feed on the protein of the animal body, otherwise it can not grow and multiply in that animal body, and consequently can not harm it. Secondly, the ferments of the cells of the animal body must not be immediately at least, destructive to the invading bacterium. When the ferments of the body have this destructive action on the bacterium, the latter can not be harmful to the former. These two things determine the pathogenity or non pathogenity of a bacterium, and one or the other lie at the base of all bacterial susceptibility and immunity."

Accepting the animal theory of the bacterium, *puts the battle on a more equal basis*, seems more reasonable if we are to look upon the process of immunity as a battle for ascendancy in the human body. Certainly the life forces have much to do in inhibiting the growth of the destruction bacteria for after death the bacteria take complete possession of the body.

Large quantities of virulent anthrax spores are required to infect guinea pigs or mice by the intestinal canal whilst very small quantities suffice to infect, either subcutaneously or by the lungs if the infective material be finally pulverized. Other truly protective appliances of the body are the acid reaction of the normal stomach contents, the *bactericidal* properties of the saliva, &c, &c.

Rickets & Dix say, "Many specimens of Micro-organism flourish in the oral cavity, some of them being pathogenic. Staphylococci Streptococci pneumococci, &c. They are constantly removed by the saliva, and through the extreme desquamation of the epidermis occasioned by mastication. *Saliva is not germicidal* but inhibits the growth and weakens the virulence of some bacteria. The fetid breath and sordidity observed in fevers where the mouth is dry, is attributable at least in part to the lack of saliva with its antiinfectious properties. Metchnikof does not believe the saliva has much bactericidal power, and quotes Miller and his experiments with saliva, not meaning to detract never so slightly from the great work that Miller did, we must remember that he held the chemical theories of Pasteur, and we believed at the time that his work was published that the tests were not conclusive because saliva in a test tube would naturally lose some of its qualities by being taken from its natural environment, and in the light of the latest studies and theories of immunity this seems to us conclusive.

It is shown that the Leucocyte is the most active and the greatest factor in immuniton and as the leucocytes pass readily through the mucous surfaces, and that the saliva contained soluble ferments are we not warranted in concluding that the fluids of the mouth contain all of the necessary elements to produce immunity, not only to decay of the teeth, but also have an inhibitory and destructive power over other pathogenic bacteria. As has been shown above local conditions have a decided effect upon the effectiveness of the immunizing power of the part and that brings us down to the one subject of interest to us as dentists, for as dentists we are the constantly called upon to correct the conditions which render immunity imperfect or impossible. Therefore it is our duty to correct them, but we also ought to have the power to order such treatment as is necessary. May it not be possible that the dentist may have the same power as the physician to order fresh air, pure food, sanitary homes, etc. If we are to be held responsible for the health of the patient should we not have the right to insist upon such conditions as would make our work effective? We have long been taught that there is a fierce war between the elements of the body and the destructive bacteria that are constantly striving to enter it, and to carry the analogy a step further may we not consider the oral cavity as the first battle ground and it is part of

our duty to clear away the rubbish that encumbers it thus aiding as best we may.

That dentistry has made wonderful progress in the past few years is self evident. Prophylaxis and hygiene has come to be a part of the practice of all progressive dentists, and some of our members are actually getting fees for preventing the decay of the teeth. It is not a part of this paper to discuss *serum therapy* as applied to dental practice. We have not progressed far enough in our study of the subject to be impressed with its possibilities. But we do believe that the study of the natural immunity produced by the fluids of the mouth and the treatment necessary to maintain their efficiency will prove of great benefit to the patient and should bring much profit to the successful practitioner.

THE ETIOLOGY, DIAGNOSIS AND TREATMENT OF DISEASES OF THE DENTAL PULP, AND NON- SUPPURATIVE PERICEMENTITIS.*

BY J. P. BUCKLEY, PH. G., D. D. S., CHICAGO, ILL.

The Chairman of the Program Committee has asked me to continue the symposium on the dental pulp, its diseases and sequelae, which was begun at our last meeting; and I am to confine myself to the etiology, diagnosis and treatment of the diseases of the pulpal organ, *per se*, and non-suppurative pericementitis. To say the least, your Chairman was liberal when he made this assignment; for a lengthy paper could well be written on any one of the several subjects under this heading.

Ever since I began the practice of my profession, I have secretly harbored the belief that Dental Therapeutics is of sufficient importance to occupy a place in dentistry by itself; and to this end I have labored for over fifteen years, hoping and confidently expecting that some bright day, in the not far distant future, this subject might be divorced from Operative Dentistry, to which it has long been subordinated. It afforded me, therefore, no small amount of satisfaction to listen to five of our recognized leaders in the field of Operative Dentistry admit, consciously or

*Read before the Chicago Dental Society, Dec. 16, 1913.

otherwise, at our last meeting, that the treatment of the dental pulp and the filling of root-canals, which properly belong to Therapeutics, constitute one of the most important phases of dental practice.

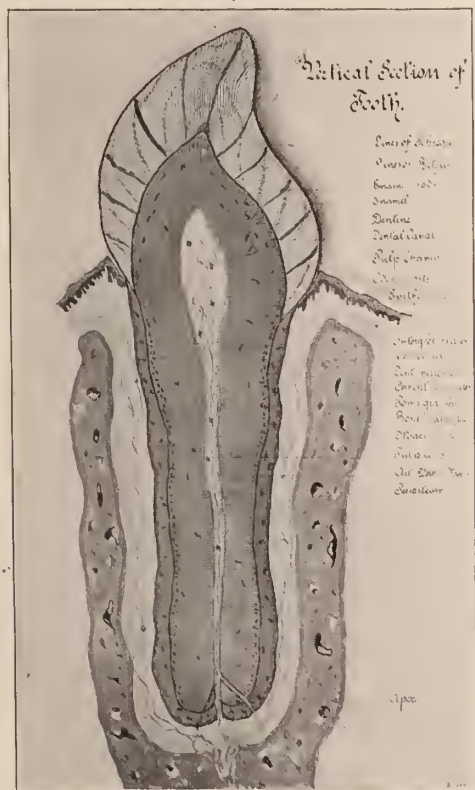


Fig. 1.

In the treatment of the dental pulp, as in all other therapy, it is highly essential that we differentiate between the various kinds of diseases of this organ, and by means of reasoning, using common sense and judgment, and the process of exclusion, arrive at a correct diagnosis before applying our therapeutics. Any other method of procedure is little short of guesswork; and we must admit that there has been too much guessing at results, on the part of many, in the dental therapeutics of the past. In order

to correct this evil we should delve more deeply into the science of pathology, and then learning to properly interpret the clinical manifestations of these various diseases, we can select and apply our remedies along more rational lines.

To know a tissue or organ in disease one must first know it in health. Therefore, let us briefly review the anatomy and physiology of the dental pulp. Fig. 1. Our histologists inform us that this organ is the remains of the original dental papilla, changed somewhat to meet its present environment, and is composed of soft embryonal connective tissue, with an outer layer of odontoblastic cells, and the whole being well supplied with bloodvessel and nerves. The bloodvessels of the pulp are supposed to communicate with the general circulation through the apical foramen or foramina of the tooth. One or more small arterial trunks enter the pulp cavity at the apex, and coursing occlusally through the center of the tissue, give off many branches. Near the occlusal end of the pulp they further divide into capillaries, and form a fine plexus around the peripheral portion of the pulp. The bloodvessels are generously distributed through the tissue. The veins form a similar plexus, and a central vein, analogous to the artery, receives the blood from these many venules and conducts it through the apical foramen. The nerves of the pulp are transmitted through the apical foramina together with the bloodvessels. Several bundles of medullated nerve fibers enter the foramen and break up into a plexus of nerves, which are widely distributed through the pulp tissue. (Turner).

The walls of the pulpal bloodvessel are unusually thin. The arteries are found to be almost devoid of the external fibrous coat; and, according to Noyes, the muscular layer is represented by a single involuntary fiber, while the walls of the veins are formed by a single layer of endothelial cells. It has long been known that the pulp tissue, like the brain, contains no lymphatics, and when we recall the thinness of the walls of the bloodvessels and that the organ is confined within a cavity having unyielding walls, the absence of lymphatics becomes of the greatest pathologic significance.

Before taking up the pathology of the pulp, let us consider for a moment some of the more common sources of irritation to

this organ and pericemental membrane, due to the ignorance or carelessness, or both, on the part of dentists. So far as drugs are concerned, I am of the opinion that alcohol causes more irritation to these structures than any other one remedy. Ethyl alcohol is a most excellent agent, but a much abused one in dental practice. For removing the gelatinous coating and sterilizing the crowns of teeth included in the rubber dam, it is invaluable, but it is never necessary to use alcohol as such to desiccate or sterilize the dentin of a cavity in a vital tooth which we desire to fill, or for desiccating a canal previous to the insertion of a root-filling. That these results can be accomplished by using this agent, no one will deny; but, if you will only stop to consider, you must also know that the results are too frequently obtained at the expense of irritation to the pulp and tissue in the periapical region. I know that the use of alcohol for such purposes has long been an established practice, and how startling and, to some perhaps, foolish these statements may appear; but, nevertheless, I know too that these indictments against the indiscriminate use of alcohol in the treatment of teeth are justifiable, when we are considering the etiology of these diseases. What then, you may ask, shall we use as a substitute? My answer is a 10% alcoholic solution of Phenol Compound, or some other remedy having similar properties—those of desiccant, anodyne and disinfectant. The popular belief is that phenol is like an oil and that it is necessary to follow its use in a cavity, for example, with ethyl alcohol in order to have the cement adhere. This is an erroneous idea. Phenol, though oleaginous in its physical appearance, is not an oil, any more than is sulphuric acid which is also oleaginous in character. Phenol is an alcohol and can be evaporated with warm air almost as readily as ethyl alcohol, and absolutely without irritation (pain) to the tissues involved.

Still another common and fruitful source of pulp irritation is the lack of protection to the organ in our extreme methods of cavity preparation in filling vital teeth, frequently resulting in the metallic inlay or filling being placed in too close proximity to the pulp. Far be it from me to decry the principles involved in Operative Dentistry; but my experience has taught me that in filling proximo-occlusal cavities in molar and bicuspid teeth,

especially with inlays, with the opportunity afforded for occlusal anchorage, it is not necessary to approximate the pulp as closely as is advocated by some teachers on the ground of principle. This word "principle" is a broad term, and we should remember that there are principles involved in the treatment and protection of the dental pulp as well as in the retaining of a filling or inlay in the tooth. I have long since stopped trying to make myself and my patients believe that teeth, the pulps of which are thus continuously irritated by thermal changes, will soon be cared for by Nature, when no further trouble will be experienced. On the contrary, I know that while Nature is a kind mother, sometimes I think so kind that we are inclined to take undue advantage of her, that in the majority of cases, both constructive and destructive diseases result, which subsequently necessitates the removal of the pulp. I might well continue this discussion along the line of preventive therapeutics; but time will not permit.

Let it be understood, then, that the dental pulp is a delicate and susceptible organ, responding to the slightest irritation, it matters not whether the irritant be of a thermal, mechanical, chemical, or electrical nature. Inasmuch as any one of these various classes of irritants may cause hyperemia of the pulp, and this disease if continuous and progressive, may result in more serious pathologic conditions, I will now direct your attention to the pathology of this organ, considering the etiology, diagnosis and treatment of (1) such constructive, and (2) destructive diseases that are commonly found in the general practice of dentistry.

CONSTRUCTIVE DISEASES.

Secondary Dentin. The deposition of what is known as *secondary dentin* frequently occurs in the pulp-chambers of teeth as the result of slight but continued irritation of the pulpal organ, after it has enjoyed a physiologic period of rest from dentin formation. This particular calcific deposit is always attached to the dentin, immediately under the site of irritation; and, if produced in a limited amount only, affords a natural protection to the pulp. The causes of secondary dentin are many and varied. The stimulus may result from such external irritation as exposed necks of teeth, abraded or eroded surfaces, cavities of decay, metallic fill-

ings, gold shell crowns upon ground-down vital teeth, etc. It is possible and often-times advantageous to so treat, stimulate and yet protect the pulp in cases of deep-seated cavities that a layer of secondary dentin will be deposited. I shall refer to this again in connection with the treatment of active hyperemia of the pulp.

In those cases where the stimulus continues over a period of years, we are quite likely to find the pulp-chamber and root-canals filled with secondary dentin. The diagnosis and treatment of this condition is unimportant unless untoward symptoms arise indicating an acute apical pericemental involvement or neuralgia, in which cases the pulp should be removed. The radiograph here is an invaluable aid in arriving at a correct diagnosis. The removal of the pulp in these cases is often a

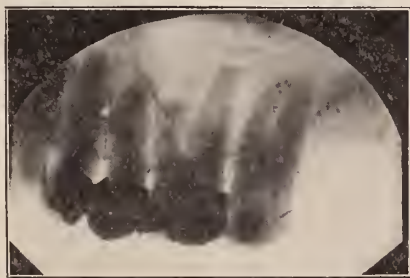


Fig. 2.

difficult problem, for neither cocain hydrochlorid nor arsenic trioxid will affect pulps thus diseased in the usual way. It is frequently necessary to resort to interosseous anesthesia by the periapical injection of a local anesthetic or to the administration of nitrous oxid and oxygen in order to remove these pulps without pain. Many an obscure case of neuralgia has this condition as its greatest etiological factor. We have such a case illustrated in Fig. 2. This patient had been suffering for several months with trifacial neuralgia. There was no unusual tenderness in any particular tooth. The two bicuspsids were both pulpless teeth and the canals filled. The second molar responded to the tests for a vital tooth. The first molar had been filled with amalgam for a number of years, and the radiograph shows that the canals are practically obliterated by the deposition of secon-

dary dentin. The extraction of the tooth, which was necessitated owing to the difficulty of entering the canals, temporarily at least has cured the neuralgia.

In this case (Fig. 3) I desired to insert a bridge. On opening into the third molar and second bicuspid, which teeth were



Fig. 3.

to be used for the abutments, we were unable to find any canals in the bicuspid and only a small lingual canal in the molar. The radiograph confirmed the clinical findings. The patient gave a history of having had an operation for abscess of the frontal



Fig. 4.



Fig. 5.

sinus and both antrums about ten years previous. The bridge was inserted in January 1909, and has given no trouble since. Fig. 4, is from a negative taken about one week ago, about five years after. In the case now before you (Fig. 5) I was unable to find any canals in this lower molar; nor could I find any

reason for their having been obliterated. The tooth was afterwards filled and has been perfectly comfortable since, which has been about three years. This case (Fig. 6) is from the practice of Dr. J. N. Crouse. This slide shows four perfectly sound teeth which were extracted from one mouth. When the patient first presented, in the middle of the night, he was suffering severe paroxysms of pain and during one attack he dropped to the floor

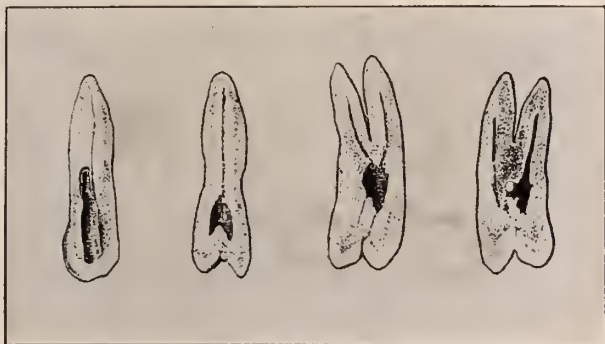


Fig. 6.

almost senseless. He had several short attacks before a diagnosis could be made. While the pain radiated all over the head, it was found by tapping the teeth that the upper first bicuspid seemed to be slightly more responsive. An attempt to drill into this tooth showed that the canals were obliterated, when it was extracted. The history of the other teeth is similar, except the trouble could be located with less difficulty after the first experience; then too, as the illustrations show, the disease had not progressed quite so far before the teeth were extracted.

Pulp Nodules. These are calcific bodies of varying shapes and sizes, supposedly the result of secretion, and occurring within the pulp, and are rarely, if ever, attached to the dentin. They are found more generally in middle-aged or elderly patients whose teeth have been subjected to such continued irritation, the source of which was mentioned as an etiological factor in the formation of secondary dentin. Black, however, observes that pulp nodules may, and frequently do, form in other teeth of the same denture which are not directly involved in the irritation; and that irritation of the pulp of one tooth very frequently causes a general hyperesthesia of the pulps of all the teeth in

that mouth, especially is this true of that type of individuals classed as neuralgic.

The diagnosis of pulp nodules is not always a simple matter. The symptoms are of the subjective variety, and the radiograph does not always confirm the suspicion. Moorehead reports one case where a pulp nodule is distinctly shown in the picture. On opening into the tooth the nodule was found to be present. The treatment of these cases is practically the same as that of secondary dentin and involves the removal of the pulp.



Fig. 7.

Fig. 7. The slide now before you on the screen is the best specimen of a pulp nodule that I have ever seen. The tooth is a lower third molar and was extracted because it was causing more or less trouble. There is but slight mechanical abrasion and no other known cause for the pathological condition. I will pass this specimen around as the original shows better than the picture. Attached to this card also is another specimen which is now upon the screen (Fig. 8). This shows a pulp nodule nearly one-quarter of an inch long which fits the canal as perfectly as a pea fits the pod. The tooth for years had carried an ill-adjusted gold shell crown, which had been placed without devitalization and the proper trimming of the root. On the slide also is shown several nodules of varying shapes and sizes, such as are commonly found in practice. Both of the above slides are from drawings of the extracted teeth. The following six slides were loaned to me by Dr. Howard R. Raper, of Indianapolis, a radio-

grapher of note, whose opinion I value highly. His description follows:

"Fig. 9. The upper arrow points to a pulp nodule in a lower

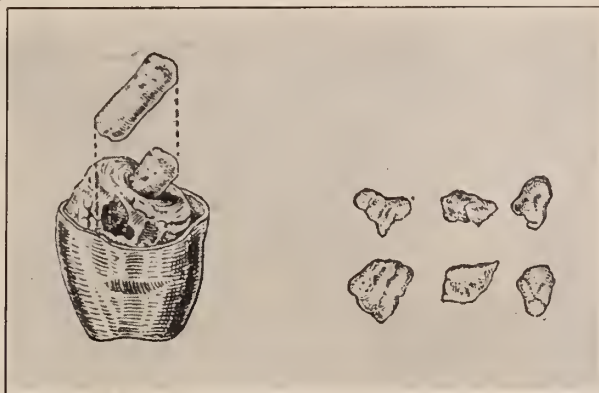


Fig. 8.

first molar. The radiograph is by Pfahler, of Philadelphia, and I have no reliable history of the case. The radiograph would lead me to believe that the pulp-chamber has been opened up and



Fig. 9.

much of the dentin cut away from about the nodule; hence the latter can be seen much more clearly than any other I have ever seen in a radiograph.

"Fig. 10. In this case the upper third molar is missing. A pulp nodule is seen in the pulp-chamber of the upper second molar. This molar has not been opened as yet, nor will I advise



Fig. 10.

the operator to open the tooth until I have made another radiograph to verify the findings in the first one. The case is one of



Fig. 11.

neuralgia with an obscure etiology and a history of pulp nodules having been found in other teeth. I am therefore strongly of the opinion that the shadow seen in the radiograph is a pulp

nodule. The radiograph shows also a faulty canal filling in the lower molar—a condition capable of causing pain. The treatment of the lower molar, however, has failed to give relief, which leads me to believe that the neuralgia is due to the pulp nodule.

"Fig. 11. This is a case from the practice of Dr. M. L. Rhein, of New York, and shows a pulp nodule in an upper lateral incisor with an abscess at the end of the incompletely-formed root. The diagnosis was verified by removing the nodule.



Fig. 12.

"Fig. 12 shows a shadow in the lower first molar which might be mistaken for a pulp nodule. The shadow is a small amalgam filling on the buccal near the gingival line.



Fig. 13.

"Fig. 13. These negatives show nodules in all four lower incisors. The nodules in the central incisors extend practically from

chamber to apex. The teeth have been extracted and dissected and the diagnosis verified. Though these nodules can be seen in the negatives it is improbable that a lantern slide would show them.

"There is no longer any doubt as to whether or not pulp nodules can be radiographed. They can be, but it is difficult. I would never make a diagnosis from one radiograph. I would make at least two."

DESTRUCTIVE DISEASES.

It is often a difficult problem for the conscientious operator to decide upon a method of procedure that will best conserve the interest of the patient. Especially is this true when we are trying to determine whether a diseased pulp should be saved or whether it would be best for all concerned to destroy and remove it. It is so easy in most cases to anesthetize or devitalize the pulp that many dentists resort to this method of treatment in nearly all diseases of the organ. When we consider the fine and tortuous canals which we so frequently encounter and the difficulty, both of removing the dead tissue from such canals and of thoroughly filling them subsequently, it is a question whether or not the best interest of the patient is conserved by adopting this method as the general practice. I have never heretofore, nor do I intend now, to plead for the life of the pulp when the reading of the clinical symptoms clearly indicate its removal; but I do mean to say that in all cases an effort should be made to determine as nearly as possible the exact pathologic condition, and our decision should be based upon these findings. From the viewpoint of the diagnostician there are few subjects of greater importance than those of hyperemia and inflammation of the dental pulp.

Active and Passive Hyperemia, and True Pulpitis. In the pulp tissue, as in all living tissues of the body, we may have two kinds of hyperemia, active or arterial and passive or venous. The former is defined as an excessive amount of blood in the arteries and the latter as an excessive amount of blood in the veins. Active hyperemia is due to a determination of blood to a given part as the result of reaction to an irritant, and as long as it remains without an excessive immigration of the white blood corpuscles, it is active or arterial hyperemia. The cause of passive hyperemia is different. Here the blood may be held back by some obstruction in the veins which pre-

vents the return of blood to the heart. Inglis says: "The backing up of the blood following venous obstruction produces tension upon the vessels, followed by diapedesis of red corpuscles and exudation of watery fluid—the condition of edema. In inflammation arteial hyperemia appears as the first stage, followed by a collection of leucocytes along the walls of the small veins, and the immigration of some into the perivascular tissue. As this eventually leads to stoppage of the blood current, and even to stasis, the condition is essentially a venous hyperemia. Accompanying the immigration of leucocytes is an exudation of lymph, highly coagulable in character, which distends the lymph spaces in the tissue and produces the characteristic swelling."

The thing of special interest here is that in inflammation or even in venous hyperemia certain blood elements escape through the temporarily dilated vessels into the perivascular tissue, which becomes coagulated, and when the tissue involved is the dental pulp, which, as we have learned, is without lymphatics, this coagulation of the fluid elements of the blood means death. The procedure of many practitioners when an aching tooth presents involving the pulp is simply to find out whether the latter is dead or alive. If alive, cocain hydrochlorid or arsenic trioxid is generally applied, or else the tooth is treated tentatively by placing cotton dipped in oil of cloves or some other soothing remedy in the cavity, and the patient is dismissed without making any effort to ascertain the condition of the pulp—whether it is in the stage of active hyperemia or passive hyperemia or true inflammation. If, on the other hand, the pulp is found to be dead, the tooth is too frequently treated by opening up the pulp chamber and placing therein a ledget of cotton dipped into the most convenient remedy at hand, leaving the cavity unsealed for fear of causing septic pericementitis or an acute alveolar abscess, and making no further effort to ascertain whether the pulp has been infected by pyogenic micro-organisms producing pus on the exposed surface or, as sometimes occurs, within the substance of the tissue, or whether the germs inaugurating the changes are of the saprophytic variety causing pulp decomposition with gaseous end-products. It is highly essential, therefore, when a patient presents with an aching tooth, that we take the time and trouble to determine not only whether we have a live or a dead pulp with which to contend, but if the pulp is alive, whether the condition is

one of active hyperemia only or passive hyperemia or inflammation; or, if the pulp is dead whether the condition is a so-called septic pulp with pus formation or one of true gangrene with gaseous end-products. To confirm our diagnosis the tooth should be isolated and kept dry, preferably with the rubber dam, and a careful examination made. On no other basis can rational therapeutics be practiced.

Differential Diagnosis. It is generally a simple matter, by asking a few questions and observing conditions, to differentiate between the pathologic conditions of a vital pulp sufficiently to determine whether the pulp had better be saved or destroyed. In acute active hyperemia the pain occurs only when the irritant is applied, and subsides almost momentarily without treatment. Logan states that "active hyperemia exists in a pulp when the pain begins with a known irritation, lasting only a few moments, or minutes at the most, and subsiding without treatment and not starting again until the application of another known irritant is made."

Treatment of Active Hyperemia. The treatment of this condition consists in protecting the tooth from the irritant which caused the disease. If a cavity exists which is causing the trouble, an anodyne remedy is indicated. It is well to combine with the anodyne a drug which will also sterilize the dentin. For this purpose I use Phenol Compound. The menthol and phenol in this remedy, being anodynes, will cause the hyperemic pulp to revert to normal, while the thymol will penetrate and sterilize the dentin. The dressing should be retained with a quick-setting cement.

Many pulps have been irritated and frequently passive hyperemia or inflammation have been produced by the injudicious use of gutta-percha for sealing-in dressings or for separating purposes when proximal cavities existed. Unless due care is taken in the use of this material, even when the cavities are not deep and when no active hyperemia is present, infectious material or the medicine is liable to be forced through the dentin and into the pulp, causing the diseases above mentioned and jeopardizing the life of the organ. Cement had better be used for temporary sealing purposes, and before separating carious teeth with gutta-percha the cavities should be cleansed of debris, and the dentin sterilized. The cause of pulp trouble following the filling of a vital tooth can often be traced to the lack of sterilization of the dentin before the filling was in-

serted. One treatment of Phenol Compound should cure a case of active hyperemia due to caries of the tooth. At the second sitting, if the case has a favorable history, the rubber dam should be adjusted and the dressing and carious dentin removed, after which a base of cement may be inserted, the cavity prepared, and the tooth filled. In those cases where the cavity is deep and encroaches upon the pulp, it is best to place an intermediate layer of some antiseptic and non-irritating material under the cement. Here I use a paste made by mixing Thymolized Calcium Phosphate (powder) and oil of cloves (liquid). Thymol has a peculiar but favorable action on animal tissue, and it is for this reason that I prefer to have the drug as a constituent of remedies used for treating certain pulp diseases. Its action, however, must be modified by other drugs to meet the necessary requirements. I desire to emphasize the use of some such antiseptic and non-irritating paste in these deep cavities, and also the importance of covering the entire floor of the cavity with the material, thus protecting the pulp from the irritating action of the phosphoric acid of the cement used to cover the paste and to form the base for the filling. It is well to add a small amount of aristol or euclophen to the paste. These are both iodine compounds and act as a mild stimulant to the pulp, thus causing secondary dentin to be deposited, when we have Nature's protection.

Treatment of Passive Hyperemia and True Inflammation. As far as therapeutics is concerned, it is of little importance to know whether the pathologic condition of the pulp is passive hyperemia or true inflammation. In either case we have transudation of the fluid elements of the blood and diapedesis of the red corpuscles occurring, and this means death ultimately. In passive hyperemia the pain is more constant than in active hyperemia, and may start without the application of an irritant. In inflammation the pain is continuous and of a boring character, or it may be lancinating, and is frequently described by the patient as a "jumping toothache." When the reading of the symptoms indicate either of these conditions, our therapeutics differ from that prescribed for active hyperemia, for here, as has been previously stated, the pulp must be destroyed.

The treatment of exposed pulps and the technic of pulp removal was discussed by Dr. Johnson at our last meeting. There-

fore, I shall not discuss these subjects other than to say that in those cases where arsenic trioxid has been used, it is the better practice to follow its removal by opening the pulp-chamber freely and make an application of some remedy containing formaldehyd to the poisoned pulp tissue for a period of two or three days before attempting its removal. For this purpose I use Formocresol. If this is done, the tissue can be removed in nearly all cases without pain, the canals will be dry and less pericementitis will follow the filling of the canals, which can and should be done at this sitting.

Treatment of Pulp Abscess and Vital Apical Pulp-ends. In those cases when, on opening into the pulp-chamber under aseptic conditions we find the pulp to be dead, we should ascertain if the tissue has been transformed into pus with practically no odor, or whether we have gaseous end-products with the characteristic odor of a gangrenous pulp. In the majority of cases the latter condition will be found to exist. However, it is very important to differentiate between the two conditions, for the therapeutics differs. We may find pus in the bulbous portion of the pulp-chamber with the tissue in the canals near the apical ends still vital. The treatment to follow when pus is present is to wash out the pus or dispose of it by mechanical means, after which the pulp-chamber can be dried, and a remedy having the properties of Phenol Compound should be hermetically sealed in. The anodyne property will control the pain, while the thymol will again disinfect. If at the second sitting a portion of the pulp proves to be vital, as is frequently the case in such conditions, the remnant of the pulp can be anesthetized by using Phenol Compound, or U. S. P. liquid phenol and pressure, cautiously applied, with unvulcanized rubber. Frequently I have desensitized such a remnant by gently working Phenol-Sulphonic Acid into the canal with a smooth broach. This is best accomplished, of course, in lower teeth. After the removal of the remnant, the acid should be neutralized with a weak solution of sodium bicarbonate, the canals dried and an anodyne remedy sealed in the tooth.

Treatment of Gangrenous Pulps. As has been previously stated, when the pulp is dead and has been infected for any length of time it will more often be found to be fully decomposed, and a gangrenous or putrescent condition will exist in the canal. Fig. 14. By this I mean that the canal will contain intermediate and end-

products of pulp decomposition, but no pus, as is shown by this slide. We are interested here to know what remedy we should apply when this diagnosis is made. Formocresol is a *specific* for this condition. The pulp-chamber should be opened into aseptically and in such a manner as to expose the mouths of all the canals,

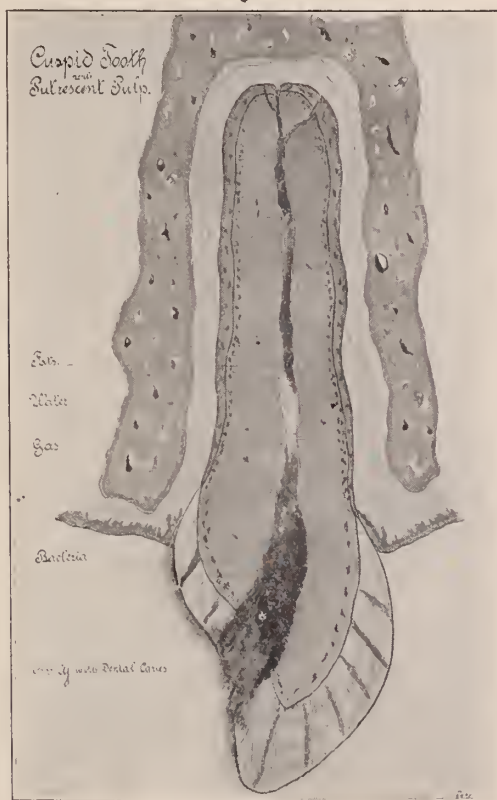


Fig. 14.

when the remedy should be hermetically sealed in. The formaldehyd gas which is constantly generated from this solution will neutralize the gaseous end-products and also cripple the bacteria. The cresol corrects the irritating action of the formaldehyd and adds to the disinfectant property of the remedy. This first dressing can safely be changed the following day, but no harm will follow if it remains a week or more. Generally I leave it two or three days;

it is then removed, the canals are mechanically cleansed, and a dressing of the same remedy is again sealed in each canal. At the next sitting the canals should be in such condition as to allow of their being filled.

Fig. 15. We sometimes find the pulp tissue gangrenous in one

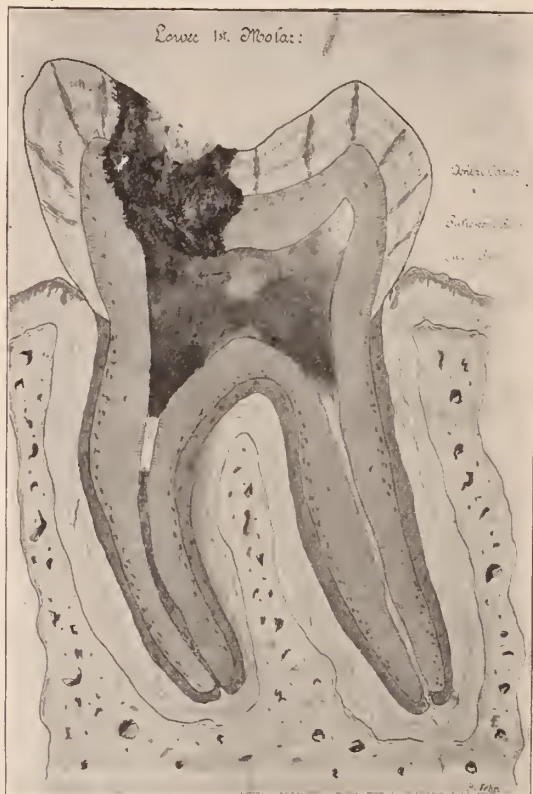


Fig. 15.

or more canals of a multi-rooted tooth and vital in the other one or two canals. In these cases, which heretofore were difficult to treat, we will find much satisfaction in the use of Formocresol. Until the patient has had a second sitting, it is difficult at times to know whether this condition exists, and if there is much vitality in the tissue, the remedy may cause the tooth to ache. There is generally enough putrescent material in the pulp-chamber, however, to neu-

tralize the formaldehyd gas, and the tooth even in these cases will not ache long. After we are certain of the condition, the method of procedure is simple, and the results are positive. A small pledget of cotton, dipped in Formocresol, can be placed over the mouth of the canals which are gangrenous, and this covered with a quick-

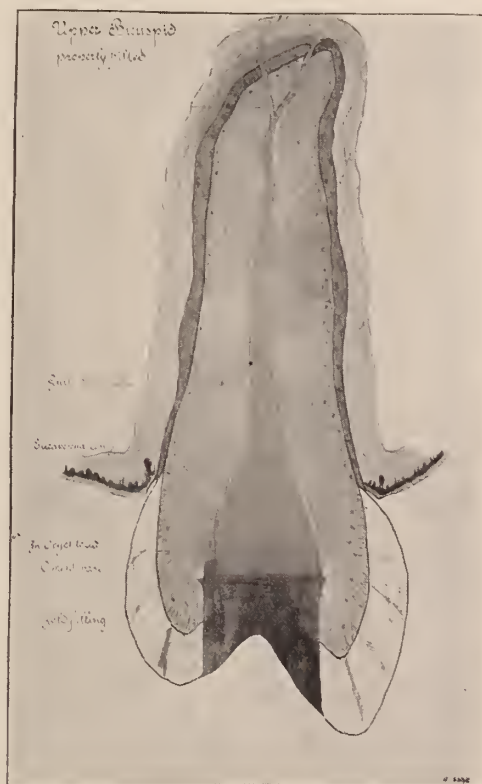


Fig. 16.

setting cement. After the cement has set, the vital tissue, having been sterilized by the previous application of Formocresol, can be anesthetized or devitalized as the operator deems best. It is never advisable, however, to place an arsenical preparation down in the canal to devitalize a remnant of the pulp.

Fig. 16. This slide shows a tooth with the canals properly filled, using Eucapercha Compound and gutta-percha cones. The

technic is practically the same as that detailed by Dr. Gethro, except where he uses eucalyptol, I use Eucapercha Compound, which contains menthol and thymol besides eucalyptol and gutta-percha.

NON-SUPPURATIVE PERICEMENTITIS.

In considering the etiology, diagnosis and treatment of pericementitis, it is important to remember that the pericemental membrane is very vascular and well supplied with nerves; that it is encased within bony walls and, therefore, when inflammation exists in the tissue the membrane becomes thickened, forcing the tooth from its socket. This elongation of the tooth is one of the main symptoms of the disease.

It is essential that we differentiate between *non-septic* and *septic* pericementitis. Both are inflammatory conditions of the pericemental membrane, the difference being due largely to the exciting agents causing the pathologic condition. Non-septic pericementitis results largely from drug or mechanical irritants, while septic pericementitis is caused by pathogenic bacteria and other poisonous and irritating substances which have escaped from septic root-canals. Both conditions may result in suppuration; the former through cryptogenic or hemogenous infection from the circulation, the latter as the natural consequence of the progress of the disease. I shall discuss the treatment of non-suppurative pericementitis only. Those cases resulting in pus formation or alveolar abscess will be considered in a subsequent paper.

There are many circumstances and conditions which modify and influence the action and effect of drugs upon different individuals and upon the same individual under different conditions. For example, we find cases occasionally where pulps have been removed by pressure anesthesia, and where, seemingly at least, every precaution was taken so far as asepsis and applying pressure are concerned, yet severe apical pericementitis follows. This may or may not be due to the drugs used in performing the operation. There are cases also where pericemental inflammation follows the use of arsenic trioxid, though all known precautions were taken. Fortunately these cases are rare; but every dentist meets them occasionally. These are conditions over which the operator seems to have no control. I know that this is a dangerous doctrine to promulgate; for it is so easy to blame the patient for some idiosyn-

crazy, when the fault is ours. Drugs are often responsible for these conditions by having been injudiciously employed; yet it is only fair to state what every pharmacologist knows to be a fact that the action and effect of drugs are modified or influenced by such conditions as disease, temperament, sex, race, size, age, habit, idiosyncrasy, temperature, method and time of administration, preparation of the drug, and dose. At our last meeting Dr. Gethro detailed a most excellent method of filling root-canals. I consider his paper on this subject a classic; one of the best I have ever read. He advocated the use of eucalyptol for moistening the desiccated canal before introducing the gutta-percha cone. If alcohol is used as the desiccant and an excess of eucalyptol is employed, which is necessary where the gutta-percha is not previously dissolved in this agent, a case of pericementitis will follow the thorough filling of the canals in almost every case. This condition will soon pass away, even without treatment; but it should be avoided if possible. This can largely be overcome by using the alcoholic solution of Phenol Compound as the desiccant and Eucapercha Compound as the lubricant. The menthol in the latter remedy modifies the irritant property of eucalyptol, while the thymol adds to its disinfectant power.

There is undoubtedly more pericementitis produced by root-canal fillings than all other drug or mechanical irritants combined. In filling root-canals we should be absolutely certain that they are *aseptic*. If there is any doubt as to this, the operation should be deferred. This is far more important than the thorough desiccation of the canal to the very apical end. It is important that the canal be dry in all root-canal filling. It must be absolutely dry if we attempt to thoroughly fill the canal with paraffin, as has recently been again brought to our attention. I say "attempt," for this is about all we can do; for it is practically impossible to get the canal absolutely dry in the apical area and keep it in this condition until we melt the paraffin. The paraffin will not adhere to a moist surface and, therefore, the foramina of the tooth will not be closed.

There are many other mechanical irritants which can be mentioned as causative factors in producing pericementitis; such as ill-fitting partial plates, crowns and bridges, malleting, regulating, faulty occlusion, calcific deposits on the roots of teeth, impaction of food between teeth with faulty or no contacts, etc. Fig. 17. This patient presented with a case of severe pericementitis. Not having

treated the tooth myself, the picture was taken to ascertain the condition of the canals of the first molar. It shows that the mesial canals were small and tortuous and not filled to the end. This



Fig. 17.

might have caused the pericemental trouble; but, at the time, I questioned it very much. You will also notice that a pulp nodule shows distinctly in the second molar. This was verified by a second radiograph. As yet the nodule is causing no trouble. The occlusion on the inlay was a little too full and there was a slight tendency toward a pyorrheal pocket on the distal, due to the tooth tipping forward owing to the loss of the first molar and the occlusion—thus opening the contact slightly. Here we had four possible causes for the pericementitis: The nodule in the second molar, the faulty contact and the resultant impaction of food between the molars, the occlusion, and the imperfectly filled root-canals of the first

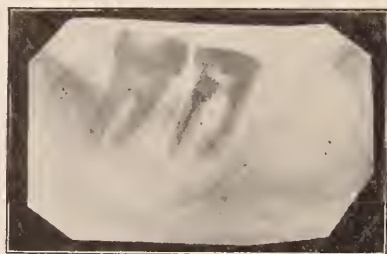


Fig. 18.

molar. The adjustment of the occlusion and the scaling and polishing of the exposed tooth-surface cured the case. This was done over a year ago and there has been no recurrence of the trouble.

The next slide, Fig. 18, simply shows how carelessly some dentists open into the pulp-chambers of teeth. While I was able to treat this case and make the tooth comfortable, it cannot always be done.

Treatment of Pericementitis. The first step in the treatment of pericementitis is to adopt the surgical principle of searching for the cause of the disease and then removing or correcting it. The symptoms of pericementitis are so characteristic that we are not likely to mistake the disease; but to locate the exact cause is sometimes difficult. For instance, in those cases following the removal of the pulp, it is difficult to know whether the cause is the root-filling, the medicines used in the treatment, or whether we failed in our asepsis in performing the operation. Personally, I am inclined to believe that it is more often the latter than most operators are willing to admit; for it is an established fact that the more nearly we approach *absolute asepsis* in the treatment of the canals of teeth, the less pericemental trouble we will have.

Both local and general remedies can be employed to advantage in the treatment of this condition. The affected teeth are extremely sore, and we are justified in using most any remedy that will give immediate relief. This is what the patient most desires, and, too often, it is what the dentist fails to give. It is not enough to paint the gum over the affected tooth with some iodine preparation. This only momentarily relieves the pain, just long enough to get the patient out of the office. We should search for the cause faithfully, remove or correct it; and then apply some liniment over the affected area. In these cases I like menthol as a constituent of the remedy, and I employ my Dental Liniment or Refrigerant Counter-irritant. These liniments can be applied freely. Care should be taken, however, to see that in applying them to posterior teeth that the patient does not swallow the remedy; especially should this precaution be taken with the Dental Liniment. The hot foot-bath and heat applied to the part by any one of the several means at our command are excellent imponderable remedies for reducing the hyperemic condition.

The administration of general remedies is more clearly indicated where the patient has lost considerable sleep and where we suspect an infection. Here it is our plain duty to give the patient rest and try to prevent suppuration and abort an abscess.

In cases of gangrenous pulps when the patient did not present

until the confined gases had escaped into the periapical tissue, carrying therein the bacteria and toxins, we will find that a practical knowledge of pathology and therapeutics will serve us well. It is in these cases that good judgment must be exercised and extreme care taken. Frequently patients delay coming to the dentist until the infection has progressed to the point where all remedies will fail in preventing suppuration; but in many instances this result may be obtained by the proper use of drugs. In this connection it is well to remember that Hopkins, of Boston, a few years ago conducted a series of experiments in which he proved that not only did bacteria proliferate more rapidly in uncared-for and neglected mouths, but that their virulency was greatly enhanced. Blair states "that certain pus-producing organisms, such as the staphylococcus and *Streptococcus pyogenes*, will always tend to produce pus. Often, however, owing to the lack of virulence or lack of sufficient numbers in proportion to the tissue resistance, the inflammatory process may be cut short before it reaches the stage of suppuration. Thus there may be swelling of the gum and face around an infected tooth, but this may subside without the formation of pus." To this I may add that this is especially true if the tooth receives the proper treatment.

Our local treatment here differs in no particular essential to that outlined for a case of gangrene of the pulp. The tooth should be located and the pulp-chamber opened into freely, under aseptic precautions, holding the tooth in some manner so that the chisel, bur or excavator will not further aggravate the condition. Then the cavity should be sprayed or washed with an antiseptic solution, dried, in this case with alcohol, and Formocresol sealed in the pulp-chamber with cement. I know to my regret that this is not the general method of procedure in the handling of these cases; but I am certain that the best results will be obtained when we follow the general rule that all remedies should be sealed with cement. This will force us to correctly diagnose the condition and employ the means and remedies indicated in the rational treatment of the case. Until we are willing to spend the necessary time to accomplish this end, we are not living up to the highest ideals of our calling. Let it be remembered that as yet there is no suppuration in these cases, and any dentist who deliberately leaves the canal and cavity open to external influences, or who uses temporary stopping because it is easily removed, and instructs his patient how to remove it should the tooth

continue to ache, either does not understand the condition he is treating or else he lacks confidence in his remedy. Make a correct diagnosis, use the proper remedy in the proper way and the tooth will not ache long—it matters not what the pathologic condition may be.

After applying the local remedies, our attention should be given to the treatment of the infection and inflammation in the periapical region, which consists in promoting or regulating the inflammatory process. Again quoting from Blair, he says: "After an infection has once gained a foot-hold in the living tissue, we must in our treatment regard not only the infection but the inflammatory process that it has excited. We are not certain that the inflammatory process itself ever needs treatment, and we know that there are very few, if any, infections that could ever be overcome without inflammation. Inflammation is Nature's way of fighting infections, and we must work with it, not against it; for otherwise our efforts will be in vain.***One of the first requisites is the regulation of the body functions, especially the excretory organs. In the presence of an infection, the parenchymatous cells of various organs may become sluggish in their action and may require stimulation." In such cases the skin may be stimulated by bathing, and saline cathartics are indicated. Owing to the facility with which it can be taken and its acceptability to the stomach, the official solution of magnesium citrate is an excellent remedy to prescribe. Magnesium sulphate can also be given for the same purpose. With this drug the patient should be directed to take a teaspoonful dissolved in a wineglassful of warm water, having a glass of cold drinking water at hand to drink at once after taking the strong hyperisotonic salt solution. The cold water removes at once the bitter and unpleasant taste of the salt. Most of the large pharmaceutical houses today prepare "effervescent salt mixtures," in which the more important saline cathartics are constituents. These are kept by the pharmacies and come as a granulated powder, which when dissolved in water make an effervescent solution. Several that can be mentioned are: Effervescent Magnesium Citrate, Effervescent Magnesium Sulphate, Effervescent Laxative, Effervescent Seidlitz Mixture, Effervescent Sodium Phosphate—and any one of which can be prescribed.

Potassium iodid in medicinal doses can frequently be administered, with beneficial results. The taste can be masked to a large

degree by dissolving it in one of the official syrups. The compound syrup of sarsaparilla or aromatic syrup of eriodictyon (yerba santa) N. F., are both good. Heretofore I have prescribed and recommended, purely on an empirical basis, the salts of quinin in the treatment of infections in certain cases. I have since learned, however, that this drug interferes with the ameboid movement of the white blood corpuscles, preventing them from migrating through the capillary walls in inflammation. The arrest of this movement lessens the phagocytic power of these scavengers; therefore, quinin is contraindicated in the treatment of periapical infections, unless we desire to lessen tissue resistance and hasten the formation of pus, when it might be given.

Pain is a prominent symptom of this disease. Generally the pain will soon subside after the local treatment; however, it is frequently advisable, where the patient is nervous and has lost considerable sleep, to administer a general analgesic. The official compound powder of acetanilid, or a powder composed of five grains of acetphenetidin and one-fourth grain of codein sulphate, to the dose, will answer this purpose. When the tooth involved is one of the upper six anterior teeth, instantaneous and often permanent relief can be obtained by using diluted alcohol, (50%) as suggested by Keefe. The remedy is administered in the form of a spray, using a watch-case atomizer for liquid, forcing the spray well back into the nostril on whichever side the affected tooth is located. Last, but by no means least, comes the establishment of physiologic rest of the affected part, so far as it is possible. This generally means the proper quota of sleep, which should follow the administration of the above analgesic remedies.

I shall not detain you longer, as I have already overtaxed your patience. In closing I desire to say that I heartily agree with the statement of Dr. F. B. Moorehead, made recently at Kansas City in the discussion of a paper, before Section III of the National Dental Association, on "Systemic Diseases Due to Oral Infections," when he said: "I consider the treatment of the diseases of the dental pulp and the filling of root-canals the most important phase of dental practice." Because of this belief, Dr. Moorehead, as chairman of the Program Committee, has inaugurated this symposium.

At the Clinical Congress of Medicine recently held in this city, Dr. J. B. Murphy predicted that the near future would witness the advance of internal medicine over surgery. Let me say that it will not be long until Dental Therapeutics will receive the recognition its importance merits; for the day is past when the dentist without a broad knowledge of this subject can render the best service to his patients. I thank you.

PROCEEDINGS OF SOCIETIES.

NORTHERN ILLINOIS DENTAL SOCIETY, MEETING IN STERLING, OCTOBER 15, 16, 1913.

DISCUSSION OF THE PAPER BY DR. J. P. BUCKLEY ON "THE DIFFERENTIAL DIAGNOSIS AND TREATMENT OF CERTAIN DISEASES OF THE SOFT TISSUES OF THE MOUTH."

DR. FRANK W. BRODRICK, Sterling:

As Dr. Buckley says of syphilis, chancre in the mouth is usually single, but not always and may appear as a papule, the superficial cells ulcerate and necrosis of the central area is followed by a copious discharge. The ulceration follows in four to ten days after full development of the chancre, until which time there is but little pain.

Chancre of the lips, mouth or tongue is followed by an almost immediate swelling and induration of the submaxillary and submental glands.

Chancres of the interior of the mouth usually begin as abrasions, excoriations or papules and are soon covered with a white or grayish white false membrane and fail to heal under ordinary treatment.

Chancres of the tonsil and pharynx are usually very painful, so much so that any violent catarrhal reddening about the entrance to the pharynx of a young adult lasting over a week or ten days and with extreme pain, without any apparent reason, should immediately excite a suspicion of syphilis.

Chancre of the lips might be mistaken for an epithelioma, but epithelioma is usually on lower lip of slow development and continues steadily to increase in size, and the lymph glands

enlarge only after months. Epithelial pearls and columns may also be expressed from the surface.

Chancre of the tonsil may sometimes show a rapid, phagadenic ulceration and might be mistaken for a malignant growth. Vincent angina also might be thought of.

Within the past year I have had three cases with marked sloughing of tonsil, one of them also involving the anterior tonsillar pillars and extending over a part of the soft palate, covered with a grayish exudate and marked lymphatic involvement and clinically the appearance much like syphilis, but with a peculiar sweet fetor that once smelled would be remembered for its peculiarity and suggesting a Vincents Angina. This was found to be so, the spirocheta and bacillus fusiformis being present in great numbers.

Salvarsan powder in enough water to make a syrupy paste was used locally and followed by an almost immediate improvement.

As Dr. Buckley has said, the secondary symptoms begin from four to six weeks after the development of Chancre, if no treatment has been given, its beginning marked by eruptions on the skin and oral mucous membrane accompanied with fever. The characteristic mucous patches occur on any part of the oral mucosa.

Secondary Symptoms: The mucous patches of the secondary stage are especially common on the tip and along the lateral borders of the tongue, and are usually accompanied by lesions of the inner surface of the lips and near the corners of the mouth. The soft palate and tonsils are usually reddened and may occasionally have mucous patches also.

The mucous patch has a sharp line of demarcation between the lesion and the healthy mucous membrane and without pain or inflammatory reaction.

Canker sores, on the contrary, are extremely painful and the immediate area is of a deep red color.

These mucous patches, in healing, may leave round pearly-white scars that may be present for years, and are known as Erb's scars.

Herpes is of common occurrence in syphilitics, especially on the tip of the tongue.

Its presence is of no value in diagnosis, however, as it is also common in the non-syphilitic. Usually very painful, lasts a few days and recurs frequently.

GUMMA.

Slow growth.

Ill-defined outline.

Occurs dorsum of tongue men over 30.

Differ.

Multiple.

Usually other syph lesions.

Borders of ulcer undermined.

Floor laminated membrane peels off with but little bleeding.

CARCINOMA TONGUE.

Slow growth.

Ill-defined outline.

Occurs dorsum of tongue men over 30.

Differ.

Rarely multiple.

Never undermined.

Covered with sloughs, bleeds easily.

The doctor has said but little of tubercular signs in the mouth except in showing the plate of a tubercular infection of entire mucous membrane of the fauces, soft palate and uvula with ulcers arising from the confluence of miliary tubercles and the ulcers covered with a yellowish white pus. He says cases are rare and have no definite local treatment, except various forms of light.

I might suggest the apparent rarity is more due to lack of diagnosis than to its actual absence. Most of the authorities agree that several percent of all tubercular cases show mouth lesions at some time.

The common occurrence of tubercular laryngitis is well known, but I will not discuss its diagnosis here, as you will probably not be using laryngeal mirrors for its examination.

The one great, predominant symptom of pharyngeal and tonsillar tuberculosis is pain.

In the very early stage there may be only a sensation of tickling, constriction or as of a foreign body, but this rapidly changes to an actual pain, constant and severe, and much worse when the patient attempts swallowing of food or use of the voice. The pain is greatest in the pharynx but extends to the ears. Great quantities of thick, tenacious mucous, add to the discomfort.

The pain increases rapidly until within even a few days it may be so severe that the patient prefers starvation to the agony of swallowing.

Regurgitation of food is common because of the imperfect closure of the naso-pharynx by the palate. This also causes a hard voice similar to that of quinsy, etc.

Temperature is increased and there is a rapid loss of strength.

The favorite sites are the soft palate, the uvula, the tonsils and the posterior wall of the pharynx. These are usually subject to an oedematous infiltration that may be enough to destroy the contour of the pharynx.

They become gelatinous in appearance and may be either smooth or covered with a warty *cucosa*, containing sub-mucous miliary nodules.

The tubercles rapidly disintegrate, forming superficial ulcers within a few days or week or two and are absolutely pathognomonic.

The edges are irregular, "worm" eaten and gradually merge into normal tissue, but may be sometimes slightly infiltrated.

The floor is dotted with minute pale-red granulations, covered with a dirty yellow secretion, and especially profuse upon the tonsil and posterior wall.

The prognosis is decidedly bad.

Mrs. L. P. Aged 23. Referred by her dentist for a slight tonsillitis that interfered with some dental work, was a case of syphilis of the most severe type, with typical lesions in the mouth and mucous patches upon the tongue.

Another case in a young woman having bridge work done with mucous patches over tongue and anterior pillars. Wassermann.

Mrs. B. Aged 45. Referred by her physician for a persistent chronic pharyngitis and with ulcerative tonsillitis. Patient insisted upon having treatment, but was referred to her dentist for removal of old roots and treatment of her pyorrhea. Case seen several months later, throat in perfect condition.

Lady, 37. Small thin woman, a mother of seven children, who has been told she was a Tubercular subject. Gumma of posterior wall pharynx. Open gumma size of 25-cent piece. Wassermann.

CHICAGO DENTAL SOCIETY.

The regular meeting of the Chicago Dental Society was held in the Northwestern University Building on Tuesday evening, December 16, 1913, at 8 p. m.

The President of the Society, Dr. George N. West, occupied the chair.

Dr. John P. Buckley presented a paper entitled "Etiology diagnosis and treatment of Pulp Stone, Pulpitis and Non-suppurative Pericementitis."

DISCUSSION.

DR. ROBERT GILLIS:

Mr. President, There are three features to be discussed, three different subjects, in fact, and Dr. Buckley's paper has covered them all. I had the paper for two or three days, but I must admit that I have not had the time to digest it all, and what I have to offer you in the way of a discussion will be very limited.

One point touched upon by Dr. Buckley as to the importance of dental therapy is worth emphasizing. There are altogether too many of us who feel that the operative field in dentistry is the greater part of it. That was true fifteen or twenty years ago, but during the last few years therapeutics has come to the front, and, as Dr. Murphy says with reference to medicine and general surgery, I feel safe in saying it is but a short time until we will recognize the greater importance of dental therapeutics.

A short time ago I listened to a paper by a surgeon of Toledo who said that if our American surgeons could only apply the keen sense of diagnosis which he observed in Europe, he felt that American surgery would be farther to the front. Even as it is now, as to technique, it is ahead of European surgery. American dentistry is ahead of European dentistry but I think we are still lacking in diagnosis.

Dr. Buckley referred to alcohol as an irritant. This seems rather a surprise, and I would like to say that it has been my habit to wash the canals with a three or four per cent solution in distilled water. I do not believe that is sufficiently strong to be such an irritant as to be objectionable. All along the line there is a movement for preventive work rather than reconstructive in the line

of pulp treatment. It is to be regretted that so many people do not come to us until forced to do so because of pain. If we could only see our patients more promptly, our preventive medicine would be of much more use.

Dr. Buckley speaks of the advantage of stimulating the production of secondary dentin. This of course is applicable in the teeth of young persons, but I do not think it is advisable in adults. In the younger teeth, the pulp has a more vigorous circulation. The apical foramen is larger, and congestion may be reduced through the activity of the circulation, while in the adult teeth, such resolution would not be possible at all. He recites two or three cases where the pulp canals have been absolutely obliterated by secondary dentine. I think perhaps all of us have encountered such cases. We often find teeth with canals obliterated, and very often without cavities or fillings in them. It would seem that there has been some traumatism which possibly has not affected that particular tooth at the time, and yet the result is indicated in the tooth years afterward in a secondary deposit of dentin.

I feel a little more at home on the subject of pulp nodules. It was my privilege four or five years ago to present a paper before our State Society on this subject. Pulp nodules are always found *within* the pulp. There will always be some slight space between the pulp nodule and the pulp chamber wall, although in some cases it may be so slight as to puzzle one to find it. Pulp nodules are more translucent than secondary dentin. They present no organization whatever. Secondary dentin may show an appearance like strata conforming to the shape of the pulp chamber. Pulp nodules vary so in size and shape that no definite idea can be given. You perhaps have all encountered them. Pulp nodules may be caused through a sympathetic disturbance. Secondary dentin, except in a few cases of traumatism, is not produced by sympathetic disturbance. In the cases with which I have come in contact, I have found pulp nodules more frequently in cuspids and third molars, with first molars coming third, than in any other teeth. They also seem to run in families. I remember one lady for whom I did some work years ago, and found nodules in 6 teeth. Within the last few months I have treated two more teeth for her and found pulp nodules in both of them. I also found nodules in her son's teeth. Pulp nodules are not singular to adult teeth. They are also found

in the temporary teeth quite frequently. I have found that secondary dentine and pulp nodules are more frequent in mouth breathers. There does not seem to be any definite excuse or reason for pulp nodules, but it appears that the nodule originates in an exudate which does not resolve itself. I demonstrated in a paper which I read previously, that they are shown by the X-ray, although at that time there had been so few found by the X-ray that it was difficult to make a definite statement.

On the question of the conservation of the pulp, perhaps I am over-radical, but the question occurs to me that if we are to treat it so as to conserve it and promote the formation of secondary dentine, knowing that a constant irritant will produce the formation of secondary dentin and knowing how often we have trouble with secondary dentine, I believe we are not taking any greater chances by treating the pulp radically and removing it. It is simply a question as to whether we will find a greater obstacle in a small or tortuous root canal or encounter the greater difficulty when secondary dentine has formed. In treating, where we find some canals putrescent and vitality in others in the same tooth, I have found little difficulty in getting results with pressure anaesthesia, and where there is no ill-smelling pus, I believe we are justified in sealing the canals which are putrescent, and after cleansing mechanically, treating the others with pressure anaesthesia. In many cases, when you first reach an exposure, you may find a little bubble of gas. After the pus has been thrown out by the blood pressure, there will come a bit of blood. As soon as you see blood coming, I think we are justified in going ahead with pressure anaesthesia.

In regard to pericementitis following treatment, I believe we can nearly always take the blame on our own shoulders. Whenever your patient has a sore tooth or neuralgia, it is a pretty safe bet that there is trouble in the tooth and it is probably your fault. In operating on a tooth troubled with pericementitis, and as a means of relieving the pressure, I do not know of anything better than a little instrument originated by Dr. Dalby that clamps on the tooth, and the patient can make a tension that relieves the strain. The administration of nitrous oxide and oxygen in such a case works like a charm. It is necessary, however, to put your patient into a rather deep analgesic state. The old-fashioned raisin poultice

will also produce results. While we are attempting to relieve the pericementitis, we should not necessarily antagonize the inflammation that is there. We should coax it along and give it time to do its work, for the inflammation is essential to resolution, and we are pretty safe in promising our patients that they will have two or three days of lameness in that tooth. While they may expect relief from the sharp pain yet the lameness will persist if the pericementitis has progressed far.

DR. GEORGE C. POUNDSTONE:

Mr. President, In the first place, I wish to compliment the essayist on the masterly way in which he has presented the subject for our consideration, and to inform him that he has not been alone in his hopes for the brighter day when therapeutics shall occupy its proper position in dentistry. Great stress has been placed upon operative procedures, while far too little has been done to increase the efficiency of the dentist in the treatment of pulps and root canals.

Seventy-five per cent of all the failures of dental operations are due to faulty therapeutics. Fillings, inlays, bridges, all fail when proper treatment technique has not been carried out. It is more interesting to the dentist perhaps to construct a beautiful piece of bridge work, artistic in every curve and radiant with a beautiful polish, than to probe and scrape and ream in tortuous and putrescent root canals, the result of which he cannot display before the admiring gaze of the patient. But unless this work be done and done thoroughly, the beautiful bridge will be as the house that was builded upon the sand.

I fully agree with Dr. Buckley in his condemnation of ninety-five per cent alcohol in cavities of vital teeth or in root canals from which pulps have been removed, on account of its irritating action upon the tissue, due to the rapid abstraction of water therefrom, and also because in such a strength its action is that of a caustic instead of an antiseptic. If ninety-five per cent alcohol is applied to a cavity in a vital tooth, hyperaemia will result in most cases, with the tenderness, soreness and inconvenience that accompanies such a condition.

To be of service as an antiseptic, alcohol should not be stronger than seventy per cent, and if used at all in root canals, a still

weaker solution would be preferable. I believe the purpose of most dentists in using alcohol in root canals is to dehydrate the dentine, which is an unwise thing to do, and I wish to say in this connection that I believe the electric and other root canal driers are the worst instruments ever put into the hands of the dentists. More roots are lost by excessive drying than by too little drying. Dry cotton on a broach will dry the root canal all that is necessary, before placing the root filling.

After the removal of pulps by pressure anesthesia or arsenic, no stronger antiseptics need be used than campho phenique, oil of cloves or the ten per cent solution of menthol phenol thymol mentioned by Dr. Buckley.

I am a firm believer in the necessity for protection of pulps in deep cavities when metallic fillings or inlays are to be used, and for this purpose use oxyphosphate cement, or if very near the pulp, the thymolized calcium phosphate and oil of cloves, and cover that with cement before placing the filling. In deep cavities, it is sometimes wise to defer the placing of the metal filling until a subsequent sitting, allowing time for the subsidence of any hyperaemia that may have been produced by working in such close proximity to the pulp, rather than adding to it a thermal irritation by the newly placed filling.

I must take issue with Dr. Buckley on his statement that all treatments must be sealed in with cement. It is difficult for a man that is expert in handling one material to succeed very well with some other material upon a brief trial. Personally, I can get much better results by sealing treatments with gutta percha than I can with cement, and it is just as unnecessary to produce pressure with gutta percha as with cement. It is easy enough to flow cement into a cavity in a lower tooth, but not so easy in an upper one, but when so placed by simply flowing there will be spaces and passages between cement and the cavity walls wide enough for the ready ingress of micro-organisms. Close adaptation of cement to the cavity wall can only be had by packing the same with gutta percha and then the liability to pressure on the treatment is the same. Cavities are rarely if ever, sealed with cement unless it be under considerable pressure. The cement under a well-adapted inlay that has been held in position until crystallization has commenced at least, is per-

haps the nearest to a perfect sealing that we can hope to secure with cement.

Then there is a prevailing idea among dentists generally that any kind of cheap cement will do for sealing treatments. This is entirely wrong and I venture the assertion that Dr. Buckley is very particular as to the quality of the cement he uses. Get good cement as cheap as you can, but cheap cement at any price is worthless. Just so with temporary stopping. No material used by the dentist has been so much abused as temporary stopping. The working qualities of gutta percha can be so modified as to render it easy to manipulate without interfering with its quality, but it is not generally so done as is demonstrated by the many worthless brands of temporary stopping with which dentists are trying to seal in treatments. Base plate gutta percha is quite uniform in quality, its sealing properties have been fully demonstrated and the matter of pressure either upon the pulp or the inter-dental tissue can be readily controlled by the technique in manipulation.

I am radically opposed to the immediate filling of root canals after the removal of pulp with arsenic or any other means, no matter what the previous treatment may have been. Even if formocresol should dry or loosen the pulp from the walls of the canal, there will be more or less tissue shreds and moisture that can be better taken care of by a subsequent treatment of a mild antiseptic.

In filling root canals, I can only emphasize the general method of the essayist. Some little detail I might vary, but the Eucalyptopercha followed by gutta percha cone is certainly the ideal root filling. If Eucalyptol is used before the Eucalyptopercha, it should be used sparingly, and wiped out with cotton on a broach before filling with the Eucalyptopercha. This is then followed by small sections of gutta percha cones in all canals, where it is at all possible to use a cone, packing thoroughly until the canal is filled. It is only in the extremely small canals that Eucalyptopercha should be used alone.

If more care and attention were given to detail and technique in root fillings, the essayist would not be able to say that "more pericementitis is caused by root fillings than by all other causes."

The treatment of pericementitis as outlined by the essayist is excellent. Remove or correct the cause, and Nature will not be

slow to do the rest. The hot footbath, heat and general remedies to aid in the eliminaiton are all of great benefit.

Dr. Buckley says: "Make correct diagnosis, use proper remedy and the proper way and the tooth will not ache long, it matters not what the pathologic condition may be." The truth of this statement is so self-evident that it cannot be controverted in any way, and what a blessing it would be to humanity if every dentist could only make a correct diagnosis. That is where we are weak. The proper remedy and the proper way would be only routine work if we had the diagnosis correctly made. The great point in this paper is the plea for the better knowledge of pathology, for with that knowledge firmly established, the treatment problem will be greatly simplified.

DR. P. G. PUTERBAUGH:

Mr. President, This paper has been so well and thoroughly discussed that I will say only a few words. Dr. Poundstone sums up the whole substance of the matter in saying that correct therapeutics depends upon a correct and careful diagnosis, and diagnosis implies a knowledge of the pathology of the case in hand. In the treatment of active hyperemia, we have to know the history of the condition involved.

There is one point I would like to ask Dr. Buckley, and that is his treatment for active hyperemia in the denudations and abrasions and erosions of roots.

There is just one deviation that I think is of importance in the neutralization of acids after they have done their work in the root canals. I find that the addition of sodium bi-carbonate produces effervescence, and that I do not like in a root canal. I like the milk of magnesia which will do the work without effervescing and perhaps forcing something through the apex of the root..

As to the general treatment of incipient alveolar abscess where you think there is some infection traveling through the roots, of course the general liniments are of great value, but I believe that the migration of the leucocytic cells of the blood would be increased more by hot fomentations over the parts than any other one thing. It is true, as the Doctor says, that quinine paralyzes this action, and I think the modern tendency of surgery is the use of the local application of heat. I like to tell my patient to wring a bath towel out of hot water and put it over the face at five

minute intervals. That increases the blood supply and increases the leucocytic action.

DR. BUCKLEY:

In closing the discussion said: There are just two points that I might reply to. I am sure that Dr. Poundstone has not used a preparation containing formaldehyd after he has removed his devitalizing fiber else he would not have made the statement he did.

In reference to the question brought up by Dr. Puterbaugh, if we have acute active hyperemia from the sources mentioned the repetition of that condition would soon bring about passive hyperemia when it would be necessary to remove the pulp, and if he could not by some means protect that pulp or prevent the recurrence of the active hyperemic condition, he might as well take it out first as last.

ODONTOLOGICAL SOCIETY OF CHICAGO.

A regular meeting was held December 9, 1913, with the President, DR. L. L. DAVIS, in the Chair.

Dr. P. J. Kester read a paper entitled "Immunity."

DISCUSSION.

DR. C. N. JOHNSON:

I am hardly qualified to discuss this subject as it should be discussed, but there are two things in connection with the paper and subject I would like to refer to very briefly. One is in regard to Vaughan's statement that the micro-organisms or bacteria we have been dealing with may be considered animal instead of vegetable. As long as I can remember anything about bacteria as taught in colleges and discussed in societies the inference has always been that they were of a vegetable nature. I am intensely interested in what Dr. Vaughan says about this because I have the greatest respect for his opinion. It may be that in studying these micro-organisms from his point of view of the animal instead of vegetable we may have some light thrown on their behavior which we have not been able to get from the other point of view.

The other question I want to consider briefly is in regard to

immunity in connection with dental caries. That has always appealed to me as one of the most practical subjects we have to deal with in our management of patients as they come to us day after day. I have had the feeling that we are able by our ministrations to patients to bring about in the mouth of a susceptible patient a condition of immunity very much earlier in the life history of that individual than that immunity would come if it were not for our ministrations. We have found in our clinical study of this subject that there are periods of susceptibility and periods of practical immunity. The greatest period of susceptibility is the period of youth ordinarily; then if the ordinary case goes on for five years we find there is in the average mouth a condition of practical immunity, *which arises*. That condition of immunity may be changed to a condition of susceptibility by change of environment. Anything which will have a profound impression upon the mentality of the individual apparently is as prone to bring about a susceptible period as is anything which makes a profound impression upon the physical organism. I have noticed it myself in practice and you probably have also, that we have been carrying a patient along in a condition of practical immunity from decay and that will go on for years. But let that individual be subjected to an enormous mental strain of some kind, or if he is a business man let him go through a period of panic, let him lose his fortune, or let him suffer a serious bereavement, that profound effect upon the mentality of the organism is likely to bring about susceptibility so far as decay of the teeth is concerned. This matter then of immunity and susceptibility goes farther than the mere presence of micro-organisms. There is something that is beyond that, particularly in this disease of decay of the teeth. Miller demonstrated that in a given mouth could be found the bacteria which under his cultivation would bring about caries which could not be distinguished from caries which takes place in the mouth. In another mouth that micro-organism could be found also in apparently the same condition, in a mouth which was immune. You will pardon me for turning from the subject of immunity and susceptibility to decay of the teeth because it is interesting to us all. There is something beyond the presence of the micro-organism which induces in one case decay of the teeth and in the other freedom from decay. Williams and Black pointed out the significance of what they called the gelatinous plaque in

the beginning of decay. Taking two mouths one of which was immune and the other susceptible there was something in the susceptible mouth which made it possible for the micro-organism to lay down the gelatinous plaque in certain positions in which the acid of decay could begin a cavity. In the other case that element which brought about the gelatinous plaque could not work; it requires an acid that is more concentrated than that floating in the saliva of the mouth to bring about decay. It was the idea of Williams and Black that the significant factor in susceptibility and immunity was the presence in susceptible individuals of these gelatinous plaques and the absence of them in a condition of immunity.

The whole subject of immunity and susceptibility strikes me as one of the most practical things in dentistry. We should study it every day in our association with patients. That study has given me the courage to continue the saving of teeth which under other conditions I would not have the courage to follow out. If we were to do that in our daily practice and instill it in the minds of the parents of these children that there is a possibility of approaching immunity we would thereby influence them to care for the teeth under such discouraging circumstances as otherwise they would yield to the forceps and give up the battle. This study from a clinical point of view has armed me against discouragement in the management of some apparently hopeless cases I have carried through my practice and changed a given mouth from a condition of susceptibility to one of immunity. That change has been one of the greatest encouragements and to me one of the greatest satisfactions I have had in my professional practice.

DR. J. G. REID:

I have seen some things in early practice touching upon this subject that at one time led me to believe that we were about on the threshold of solving the problems of susceptibility and immunity and later in life as our clinical experience advances it seems as though we would have to go back. The constant investigations of today are apparently leading us to conclude that our earlier theories are of no account. Like the old change in chemistry we have got to learn over again.

This article that Dr. Kester has quoted from, coming as it does from so great an authority, would naturally place a very big stumbling block in our theories of a few years ago. If we go back

probably it will be found that we have been studying vegetable life and not animal life and that our theories may be entirely upset and we have got to begin over again in the new work. It is only time and investigation that will prove the fallaciousness of the former theory or the correctness of the present theory.

The subject of susceptibility and immunity to decay of the teeth is certainly an interesting one. We see so many things from a clinical standpoint that completely upset our knowledge of things that we can hardly believe anything. It is like the proverbial dento-socketitis, some of the most wonderful and strange things occur with that proverbial disease which would discount any theory that has ever been advanced from nature's own duties. It takes hold of the case and does things that nobody else can do; and yet what is it? We do not know much today when we see these remarkable conditions. They vary from day to day and from year to year. I do not really have much faith in hardly anything I read because I see so many things that do happen that are so strange and so contrary. Therefore, I feel that anything I may say in this direction would be hardly worth recording. I hope I may live long enough to see the strange things that may happen in the investigations that are to come within the next few years. Something seems to be happening. More investigation, more observation is being recorded from day to day. Old theories are being discounted, new theories are being advanced and it seems that we are on the fence and we are ever ready to grasp at anything that will prove a positive diagnosis of conditions.

DR. J. H. WOOLLEY:

Ehrlich says that the word immunity means the power that the system has to resist disease. It is a specific condition. When a person has had an attack of smallpox, it is rarely ever or never that that same person has the disease again. The same is true of scarlet fever or of measles, and so Ehrlich goes on and reasons this matter out. I think that systemic conditions sometimes cause conditions of disease that arise in the mouth and vice versa. They are regional or diseases of the oral cavity. The causes of diseases of the system we have not settled. Ehrlich seems to think that there are certain cells at work which influence disease. He says that the nervous system is affected by certain drugs such as strychnin and digitalis which are used in treating heart diseases and

also another medicine known as pilocarpin. The latter I think affects the secretory system. He claims that each cell has its own individuality; that the cells in the nervous system, the cells in the glandular and in the muscular systems have an individuality of their own that makes it impossible to pick up the floating particles in the blood. In other words, certain cells will pick up certain forms of toxins. He has a long theory about this which he advances. These cells have a certain affinity for certain kinds of toxins or a certain form of toxins. He describes the action as occurring in a mechanical way.

In his line of work he first took up dry smears and colored them with certain drugs with certain white blood corpuscles in the different parts of the body and he found that they picked up different colorings and in that way he adduced his arguments that each cell has its own individuality. For instance, he took a rabbit and in experimenting with it used methylene blue and he found that the nervous system was colored with the methylene dye. No other part of the system was affected by that coloring, and then he went on to reason from that that certain cells have certain affinities. He went on to show what manner of toxin has its effect upon these cells and how an individual is made immune to decay. It would take too long to try to say any more on the subject; but the great question that is to come up is as to whether disease of the oral cavity is affected in a systemic way, or whether the systemic effects have anything to do with such a disease as pyorrhea and all these other effects are incidental to the oral cavity; whether the system causes that or whether it is the systemic condition that affects the disease of the mouth in the way of saliva, and thus causes caries.

DR. REID:

I would like to ask the author of the paper if he or any other member of the Society has ever seen immunity from the progress of erosion?

DR. TRUMAN W. BROPHY:

I think the question before the society is one somewhat outside of my sphere, yet I am interested in it because it seems to me to be one of the most important before the scientific world today. The question of immunity from disease is attracting more atten-

tion now than any other that the medical profession has to deal with. The brightest minds in scientific medicine are struggling with this great problem with a view to solving it in its many aspects.

I was very glad indeed to hear Dr. Kester's paper and to learn that he has been studying this question with such care. I was sorry that he did not invite to this meeting this evening Dr. Rosenow who has done and is doing so much in the field of bacteriology to isolate the micro-organisms which are responsible for certain infections or diseases. To such men, and to this modest man in particular, we owe a great deal. Dr. Hartzell in his investigations leans upon Dr. Rosenow and depends to a great extent upon his judgment in confirming his findings, and I wish to state while I am mentioning his name that Dr. Hartzell has had a career in microscopy which especially fits him for the tremendous work which he is now engaged in by action of the National Dental Association. Dr. Hartzell has been studying microscopy since he was a boy fourteen years of age, and the microscope is to him an everyday instrument. He is well acquainted with the use of it, as much so as the dentist is acquainted with his excavators, pluggers, and the like. So in the work he is doing I think we will be able to achieve a great deal in this particular field of immunity. I dare to predict that the profession may in the years to come, perhaps in the near future succeed in the discovery of a method of procedure which will make many patients immune from caries of the teeth. I believe that the time is not far in the future when a young child may be taken and so treated by vaccines as to make caries of the teeth impossible provided oral cleanliness is practiced. That is rather a bold prediction and one which I am satisfied would not be seconded by very many members of the profession, yet what is needed will come, and everyone knows how much immunity to dental caries means to the human family—we witness the terrible destruction of the human teeth, and we are so hopeless and helpless, impotent to prevent that destruction. I have a lot of faith in scientific work and the possibilities of development along scientific lines which will enable us with equal certainty to make the mouth immune to the infection of caries, as I have in the belief that one may be made immune to the affection of small-pox or the affection of diphtheria and other diseases. I am one of those who believe that the time is near at hand when all fears of infectious diseases will be met with suitable

means and by employing vaccines these diseases will be made impossible.

This evening, before the reading of the paper, we discussed in a conversational way the prevalence of specific disease, and its increase. I believe, as much as I believe I am here tonight, that in the years to come it will be taken up by the nations and authorities, municipalities, and by vaccines these diseases will be stamped out. People will be made immune to such infections. That is predicting a great deal for humanity, but it will end, if that happy consummation is reached, untold suffering on the part of the innocents who are contaminated without a knowledge of the horrors of such diseases.

I am not discussing the paper of the essayist very closely, but inasmuch as it is on immunity I have been led into these thoughts by the feeling that it should be so.

I want to congratulate Dr. Kester on his paper and to ask him his forgiveness for not confining myself more closely to the teachings and sentiments expressed in it. It was an excellent paper, and one that I shall read with a great deal more profit when it shall have been published.

DR. L. L. DAVIS:

We know that immunity is practically that power of the body to resist the invasion of the micro-organisms, so that it may either stop them from proliferating or, at least, reduce their virulence to such a point as to practically make the body immune. That is all immunity is. It is a vital condition of the body. The opsonic index is another term for immunity. It is that condition of the body, that vital something we do not understand, to resist the action of diseases. We know this much, that when the body is invaded by some pathogenic microbe, that every cell in the body contributes to the fighting of that invasion just in the same way as the United States, or the different states of the Union, would contribute their quota to fight the invasion that might occur down in Panama, supposing the enemy should attack that one point. The body is drawn upon from all parts. Every cell has this function, and the whole body is drawn upon to resist the invasion and are hurried to the point of invasion as fast as possible. If the invading member is active enough to get not only a foothold, but a very strong hold of the part that it invades, it may be able to proliferate in such a de-

gree that the cells of the body cannot produce soldiers in sufficient numbers to fight back the invading enemy. That is the condition of disease, and if the body is strong enough to produce anti-bodies as they are called that will take up and destroy the invading microbe, then we have either health or disease. In the action of diphtheria and in the injection of antitoxin we have the same thing. In diphtheria the invading microbe proliferates with such intense rapidity that while the body has the power to produce anti-bodies in sufficient number to destroy, yet it cannot produce them in sufficient quantity in time; and so antitoxin is introduced into the human body to immediately take up the work of destruction of the invading diphtheritic microbe and allow nature, at the same time, to go ahead and produce still further numbers of the anti-bodies, so that the person infected may finally result in the complete conquerer of the invading microbe.

What we may be able to do in caries in that way I do not know; but I know at the present time they are having quite a little success with vaccine in the treatment of pyorrhea. Several members of our profession are reporting very favorable results from the use of vaccines in pyorrhea, vaccines made from cultures within the mouth of that person. Cultures are made and inoculations are performed from the cultures made of that one person, and without any attempt at isolation of any one micro-organism, but a simple culture made from that pocket. A vaccine is made from the pocket and reinoculated, when a lessened degree of intensification results in a final absolute cure, so they claim at the present time, with absolute immunity from pyorrhea afterwards. So we are just on the verge of great discoveries and great work along these lines, and I am glad to see that this subject has been taken up to-night. This is certainly work we must take up if we want to keep up our reputation, and I think we are starting out the year right, and if Dr. Woolley has a paper along the same lines, it would be wise for us to invite such a man as Dr. Rosenow to be with us at that time.

DR KESTER (closing):

We did not attempt to cover the whole field of immunity nor the various theories of the causes and processes, but the main thought of the paper was to call especial attention to the natural immunity found in the oral cavity, and some of the conditions, wherein the dentist has the opportunity and the power to control

or modify them. Dr. Davis has rightly said that there was a constant battle between the protective elements of the body and the destructive bacteria, and I have suggested that the oral cavity is the first battleground. All dentists are realizing that prophylaxis and hygiene are the most important factors in the conservation of the teeth. But the great and underlying factor is the natural immunity of the mouth caused by the inhibitory power of the natural elements of the body. When we realize these facts and practice scientific dentistry and get fees for saving teeth, then will the millennium of dentistry have arrived

GOLDEN ANNIVERSARY.

Do not forget the Golden Anniversary of the Illinois State Dental Society, March 23-26, 1914. Arrangements are now so far perfected that this promises to be one of the greatest meetings ever held in Chicago. Mark off your appointment book now.

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Devoted to the Advancement of Dental Science,

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EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

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EDITORIAL.

CHICAGO TAKES OVER THE PUBLIC SCHOOL DENTAL INFIRMARIES.

A real triumph for the principle of oral hygiene and its relation to the community weal has just been achieved in Chicago. For several years free dental infirmaries have been established in the public schools maintained by private means and enterprise. The chief benefactor was Mr. Julius Rosenwald who in 1912 equipped six infirmaries, which with the ones already in operation made ten in all, and volunteered to maintain the ten on a salary basis of \$10,000.00 per year till such time as the city should take over the work. Meanwhile the city had employed a dentist as a regular member of the Department of Health, and it was his function to supervise the work of the infirmaries as well as the inspection work which was all the while progressing by voluntary service on the part of members of the Chicago dental societies. In all about 70,000 children have had a careful examination by a dentist, without expense to the city or its citizens.

The attitude of the Department of Health to this movement has always been most cordial. It was due to the influence of Dr. W. A. Evans, who was then Health Commissioner, that a dentist was appointed on the Health Department. When the present Commissioner, Dr. G. B. Young, came into office he assumed the same cordial relation to the movement, and in making out his budget for the year of 1914 he included a provision in it for taking over the dental infirmary work so that it should be maintained by the city—where it properly belonged.

The attitude of the council committee toward the budget generally in cutting many of the estimates left some doubt as to the fate of the dental appropriation, but to the glory of the committee and the honor of Dr. Young it was passed, and thus made a permanent feature of the city administration.

The significance of this action is more far reaching than even those most intimate with it today can imagine. It places the care of indigent children where it belongs, and it is a civic recognition of the importance of oral hygiene as it relates to the community. We believe that the work in Chicago, aside from its permanence in being maintained by the city, is better arranged than in most places. The infirmaries are located at different points in the city in the public school buildings in those districts where most needed. The Board of Education has kindly set aside rooms for this purpose and fitted them with the necessary water and gas connections, so that the children who are suffering do not have to make long street car journeys to obtain service.

When this work is extended, as it surely will be, to reasonably meet the urgent needs, we will have in Chicago a more representative and better planned system of dental service for the poor than in any other city with which we are familiar.

The next great step, and one even more important than that already taken, is to organize a campaign of education among the poor and ignorant to the end that much of the present appalling tendency to dental diseases shall be prevented. We are really only at the beginning of our true mission as philanthropists in building up a better citizenship among those who heretofore have not known how to foster their own efficiency, and it remains for Chicago to follow up the work so commendably begun.

DR. JOHN N. CROUSE.

As announced in our February issue Dr. Crouse died Jan. 16, 1914. The passing of this man rounds out a remarkable career, one full of incident, action and achievement. No man exerted a more profound influence on dentistry in certain directions than did Dr. Crouse during his lifetime. He always stood for the best there was in the practical application of the science of dentistry to operations in the mouth, and much as has been said about his activities in

other directions one of his very great attainments was his ability as an operator and his fidelity in carrying out the best methods of practice in the care of his patients. He was thoroughly master of his environment in the function of conducting a dental practice, and he numbered among his patients many of the best people of Chicago.

In his profession he was best known as the organizer and President of the Dental Protective Association. In this capacity he did a signal service in stamping out many abuses which had grown up in the form of impositions on the members of the profession from worthless and invalid patents or processes used in dental practice. He sacrificed his own interests in many ways in carrying on this work, and the measure of his service will not be fully realized till the calm judgment of the coming years shall place a just estimate upon it. His greatest ambition was to organize the nucleus of a movement which should band the profession together for self-defence against imposition and wrongs and in so far as the influence of one man could do it he accomplished the purpose.

Greater details regarding his life and work are contained in the report of memorial exercises held by the Chicago Dental Society over the passing of Dr. G. W. Cook and J. N. Crouse, and which will be published in a future issue of the DENTAL REVIEW.

BANQUET TO DRS. HOLBROOK AND MAERCKLEIN.

In Milwaukee, on January 21st, 1914, the dentists of Wisconsin and neighboring states united in honoring Drs. Arthur Holbrook and B. G. Maercklein in a dinner commemorating their many years of faithful service in the profession. The event was a splendid expression of the love and high regard in which these two men are held by their fellow practitioners.

Dr. Maercklein is one of those sturdy members of the old guard who always has opinions of his own and who has the courage to contend for those opinions in the face of all the world. His ability as an operator has from the first marked him as a practitioner above the ordinary, and he has been active in so many departments of professional work that it has gained for him the enviable reputation of being an able and well rounded man. We hope that he may have many more years of usefulness. When the name of Dr. Arthur Holbrook is mentioned in any gathering of dentists in Wisconsin

there is not a man who does not instinctively feel like taking off his hat. Never was a man more universally beloved, and never did a man more richly deserve it. The writer of this article has known him for many years, and he counts this circumstance as one of his rarest professional and personal privileges. Arthur Holbrook could never think a mean thought, or do a wrong act. Even if chloroformed or hypnotized and then led to a misstep he would fight his way valiantly back to consciousness and remedy the wrong. He makes no compromise with himself, while with others he is charity and grace, and forgiveness. He is one of the best writers and clearest thinkers in the dental profession, and in after years when his articles are read they will bear out this statement. And—he is modest, so modest that it is hard to dig him out from his shell, but this only endears him the more to his friends. Much could be written of the virtues of this man, but if too much were written he would really suffer from embarrassment. There never has been in the dental profession a more lovable character than that of Arthur Holbrook, and there never will be.

THE EDITOR'S DESK.

A TRIP TO THE SOUTH SEA ISLANDS.

ANOTHER VACATION STORY.

(Concluded from the February issue.)

HOMEWARD BOUND!

We sailed from Papeete on the afternoon of August 24th, and were due in San Francisco September 5th—a straight run of 3,660 miles without a stop. I scarce think it can be possible for any one who has not taken such a trip to realize the sensations which assail one on beginning the last span of the journey toward home. If any one should have asked me four months previously where San Francisco was it never would have occurred to me to say that it was “home,” but henceforth every place in America shall seem like home to me, and I am impressed that nothing can so widen one’s domestic horizon and bind one’s national sympathies so closely together as an extended trip abroad. It is quite possible that if a

man should travel sufficiently he might eventually come to regard the whole world as his home, and yet to me I hope the time may never come, as indeed I am sure it never will, when any other place on earth shall seem quite so dear as the North American continent.

We were told that this trip would be rather more trying through the tropics than the one going towards Australia because we ran longer in those latitudes considered the hottest, but fortune apparently favored us by sending us a most delightful breeze. I have already referred to the advantage of having cabins on the port side going to Australia and on the starboard side coming back. The reason for this is that the trade winds flow from the southeast when you are south of the equator and from the northeast north of the equator, which adds immeasurably to one's comfort if one is located on the favored side of the ship. There was never a moment during the trip up that we were lacking a breeze, and this is unusual coming through the doldrums. The doldrums are formed by the confluence of the northeast and southeast trades which creates near the equator an unsettled condition of the weather—sudden brief squalls, and sometimes protracted calms. Sailing vessels are occasionally caught in the doldrums, and held there for weeks by lack of sufficient breeze. For this part of the journey I select a steamship for my purposes—it suits me better.

One thing astonished me crossing the equator this time. The temperature is taken on board ship every few hours, and this refers not only to the temperature of the air but also of the water, which usually run very close together. The temperature crossing the equator was 75° , which of course was remarkably cool—much cooler in fact than we got it several hundred miles north.

But I had one disappointment—I saw no wonderful sunrises or sunsets as I had seen going over. On mentioning the matter to the captain I learned the reason. In this part of the Pacific we are very far from land—no islands for hundreds of miles in any direction—and consequently no volcanic action or other media for creating dust. It was a most prosaic thing to learn that we must have dust to have beautiful sunsets, but this seems to be a fact. The only sunset I saw which could be accounted at all satisfactory was when we were nearly due east of Honolulu, which of course brought us within distant range of the volcanic dust.

One sees little life in the ocean on this trip. The large birds have for the most part deserted us and I never saw an albatross north of Tahiti. The flying fish are very numerous, and one day we ran into a school of young porpoises. But it must by no means be supposed that it is dull aboard ship. There was quite a full passenger list, and one is sure to meet many interesting people. I shall always look back to the voyage to San Francisco as a most enjoyable and instructive one, and while on this subject I must give myself the pleasure of making special reference to the Commander of the Tahiti, Captain F. P. Evans. Never have I met a man who combined in so remarkable a degree a complete mastery of his chosen calling, and so wide a knowledge of general literature, or rather I should say so wide a knowledge of the best literature. It was really a liberal education to sit out on deck with him during those delightful tropical evenings and discuss subjects which chanced to be of mutual interest to both of us. The delights of travel, aside from the new scenes and the varying experiences, consist for the most part in the personal contact with people of alert intelligence who are able to open up to us new points of view, and I shall always hold in vivid memory the interesting hours I had with Captain Evans.

Concerts, dances and entertainments of various kinds were held on board ship, and we were fortunate in having some excellent talent among the passengers. A conspicuous example of liberality in this respect was Mr. John Marquardt the eminent violinist who was returning from Australia and who devoted his talent to the entertainment of the passengers on many occasions. It is rare that an artist so high up in his profession as is Mr. Marquardt will place himself so whole heartedly at the disposal of his fellow passengers as he did, and much of the enjoyment of the trip was due to his generosity.

But however enjoyable an ocean voyage may be there comes a time after it has extended three or four weeks when a certain event is looked forward to with more than ordinary anticipations. It looms higher and higher as the most conspicuous thing to consider out of all the many interesting features of the trip, and there begins a general focus of all the passengers toward this one supreme happening. This of course is the arrival at the home port. We were due at San Francisco on the morning of September 5th, and I was up bright and early to watch the entrance to the far famed

Golden Gate. The moment I saw the smoke of San Francisco I forgot about the Golden Gate. I am ashamed to acknowledge this but it is a fact. There was something so familiar about that smoke that it drove every other sentiment out of my mind for the moment and made me forget the many beautiful things around San Francisco Bay. That smoke looked strangely like the smoke of Chicago—and that is all which it is necessary for me to say about it.

SAN FRANCISCO.

I had planned a good long chapter on San Francisco alone, and another on Los Angeles, but when I consider the interminable length to which these articles have run I am abashed and have not the heart to inflict anything further on my readers, except the briefest possible reference to our journey home.

I thought I was through being entertained when I reached my own country but I reckoned without a sufficient knowledge of those men of California. I could name them by the score, if I had the space, and some day I am going to California to write it up. Such a welcome home as we received from the California men, such a round of entertainment, such a perfectly happy time.

There is something the matter with the air of California though. I do not know what it is, but it seems to affect everyone who goes there. It apparently inoculates one with a germ and makes one fall in love—with California. I had a close call with my three girls trying to get them out of that state, and I am sure if we had remained a few days longer they would have inveigled me into settling down in a bungalow some place on one of the side hills sloping down toward the Pacific.

San Francisco is a miracle. Talk about Phoenix rising from its ashes. Nothing in all the ancient world can equal this modern city in its rise from the disaster of 1906. No people can rebuild a big city as that has been rebuilt unless they are a very great people, and in 1915 they are inviting the world to come to San Francisco and see what they have done. And the world must go because it will be worth the trip.

A city directory of dentists would be necessary to enumerate all the dear fellows—with their dearer ladies—who charmed us with their entertainment in San Francisco, Oakland and Berkeley. It was a revelation of western hospitality. First there were half a dozen of them at the dock to meet us and see us safely through the cus-

toms. Then there were banquets, dinners, automobile rides, and trips up the mountains and to the missions till I was ashamed to impose further on their generosity. I am going to San Francisco in 1915 to take those men by the hand again and tell them how much I love them.

LOS ANGELES.

We slipped quietly into Los Angeles without letting any one know we were coming, but they soon caught us at it and then we paid up for it. I had been cautioned about Los Angeles as a place where they entertain you within an inch of your life, and I found it to be true. At Pasadena they completed that inch. They took us up Mount Lowe, and down to Riverside; they showed us fruit orchards of all kinds but they never allowed us to look at a lemon. They dined us till we were foundered in the front feet, and they lied to us about the trains east; they said none left for Chicago for several weeks. And my three "girls" were willing to believe that story. But I finally got them headed for the Grand Canyon—which deserves a chapter, but cannot have it now.

One day late in September our quartet stepped up on a porch on Sheridan Road which overlooks Lake Michigan. We had traveled about 25,000 miles since we left that porch. We had seen some rare and beautiful corners of the earth and had had some delightful experiences; but nothing that we had seen was quite so rare or beautiful as this, and no experience so delightful. For this was *Home*—the one place in all the world after all—the one and only. It is here that the birds sing sweetest in the early morn, the flowers bloom brightest, and the old lake murmurs the softest lullabys. It is here that we reck not of train schedules, or steamship regulations, or hard beds at hotels. We may put our feet on the piano if we wish, and eat boiled onions of a Saturday night. And I—I can go out in the garage, put on some overalls and get myself all smeared over with grease tinkering with my Pierce "48". And that is the acme of luxury and comfort.

Yes this is home, where on the long winter nights we sit and talk of our wonderful trip, the sights we have seen, the experiences we have had, and best of all the friends we have met. And as we think of these friends and recall the many sacrifices they made on our behalf and the delightful times they gave us we wish we might have them all around us at this home of ours for a

grand reunion. To get them all together and be able to look into their faces and bid them welcome to our fireside would be the height of happiness.

All in all our trip to the Southern Seas was most enjoyable. It was sufficiently out of the beaten track to make everything new and entertaining, and there was not a dull moment in the four months. Best of all we were sent away on our journey by friends, were met all along the line by friends, and were finally welcomed home by friends. I have before remarked that friends are the greatest blessing we can have, and I close this long and rambling story by reiterating that statement.

THE END.

BOOK REVIEWS.

CARICATURA DENTAL. By M. Rochina Murillo, Madrid, Spain.

This is a book of caricatures of Spanish dentists with some verse accompanying each picture. Our unfamiliarity with the Spanish language prevents us from commenting on the character of the verse, but the pictures are very entertaining and it is a pleasure to look through the volume and see the representative men of Spain.

LECTURE-NOTES ON CHEMISTRY FOR DENTAL STUDENTS, including dental chemistry of alloys, amalgams, etc. Such portions of organic and physiological chemistry as have practical bearing on the subject of dentistry. An inorganic qualitative analysis with specially adapted blowpipe and microscopical tests, and the chemical examination of urine and saliva. By H. Carlton Smith, Ph.G., lecturer on physiological and dental chemistry at Harvard University Dental School; honorary member of American Academy of Dental Science, 1906; of the Metropolitan Society of Massachusetts State Dental Association, 1907; of Harvard Dental Alumni, 1910; and Northern Ohio Dental Association, 1912. Second edition revised and enlarged. 8vo, ix+403 pages, 32 figures in the text and 10 full page plates. Cloth, \$2.50 net (10/6 net). New York, John Wiley & Sons. London: Chapman & Hall, Limited, 1912.

The first edition of this work appeared in 1906, since which time it has been necessary to make many changes to bring the work up to date. It is a carefully prepared book designed to aid the teacher of dental chemistry, and outlining the order of lectures so that the laboratory work may follow closely the lectures. The chapter on Organic Chemistry is particularly interesting, embracing as it does the subjects of "Hydrocarbons," "Alcohols," "Ethers," "Organic Acids," "Ammonias," "Urea," etc. It will be found a great aid to the student in perfecting his college work.

DENTAL ELECTRO-THERAPEUTICS, by Ernest Sturridge, L.D.S., Eng., D.D.S., Fellow of the Royal Society of Medicine, Member of the British Dental Association, London, Eng. 12mo, 318 pages, with 154 engravings. Cloth, \$2.75, net. Lea & Febiger, Philadelphia and New York, 1914.

This book is practically a new excursion into a field not yet covered by writers. Numerous articles have appeared in the periodical magazines on the subjects treated in the book, but nowhere so far as we know has the entire subject been considered in a volume. The author devotes considerable space to the treatment of pyorrhea alveolaris by electro-therapeutics, and shows numerous illustrations indicating great improvement following such treatment. The book is well worth a careful reading.

PRACTICAL HINTS.

Edited by J. E. Schaefer, D. D. S.

(This department is for busy readers. We want short articles containing practical hints—the shorter the better. No article must exceed 200 words, unless of exceptional merit. Every dentist has some useful hint that has been of value to him, and if he will only put it in print it may be of equal value to others. That is what this department is for. Due credit will be given for every article sent. Address J. E. Schaefer, 1745 W. Harrison St., Chicago, Ill.)

Extracting Lower Molars:—In removing lower first molars broken down to or below the gum margins, carry the beaks of the forceps down beside the strongest root, outside of the process, cutting through the process to extract this root. Then using the right or left contra-angle elevator, depending upon whether you have re-

moved the mesial or distal root, go down into this socket and lift out the other root.—*F. F. Molt, D. D. S., Chicago, Ill.*

Restoring Broken Down Molars:—An upper right first molar can be restored with amalgam anchored in the pulp chamber. Many molars may be restored to usefulness by this method. These cases are indicated where the supporting dentin is all gone and the enamel broken down. Trim the tooth to a solid foundation even extending under the gum line. No post or matrix necessary. They are more sanitary than gold crowns.—*L. R. Snowden, D. D. S., Peoria, Ill.*

Anchorage for Fillings Intended as Abutments for Bridge Work:—Form with pliers a hollow cone of platinum to approximately fit the enlarged root canal. Place this in the canal and form the wax model over and about it, then insert the heated sprue wire in the cone, making it possible to withdraw the wax model and the post with absolute assurance that they are in proper relation. After casting, we have an inlay with a hollow platinum post re-enforced by cast gold.—*W. A. Hoover, D. D. S., Gibson City, Ill.*

To Exclude Moisture from Proximal Cavities Extending Below the Gum:—Take small piece of beeswax, place on thin matrix which has been curved to conform to shape of tooth, hold over flame till melted. After cooling scrape away excess of wax except at cavity margins; then adjust matrix using wedge or ligature to adapt it to margins of cavity. Apply rubber-dam as for a simple cavity. This method is very effective for arsenical applications and pressure anaesthesia.—*H. M. Butler, D. D. S., Sullivan, Ill.*

Relieve Plate Causing Irritation:—Patients should be informed, when a lower denture is inserted, that it is far more liable to irritate the membrane than an upper denture. That if it does they cannot eat, but must come with the teeth in the mouth, after it has been in long enough to irritate, so it can be seen by the dentist. Sometimes it is difficult for the dentist to exactly locate the spot on the plate. Take a little moist whiting on a spatula, and apply to the irritated spot, place in the plate, and on its removal the spot is

then indicated. Relieve with small carborundum.—*L. P. Haskell, Chicago.*

A Method of Anchoring a Large Amalgam Filling:—In large amalgam restoration when the life of the pulp has been destroyed a rapid and convenient method of anchorage can be obtained by the use of a $\frac{1}{4}$ inch "oo" wood screw. These screws (one or more) to be screwed into the root canal using a broken instrument properly shaped as a screw driver. The screw cuts its own threads in the root canal and may be covered with cement. These screws may be obtained at the hardware store in brass or they are made by the Manhattan Dental Supply Co. in platnoid and may be purchased from your dealer.—*R. E. Luther, D. D. L., Batavia, N. Y.*

The Gillmore Attachment:—The Gillmore attachment may be used for restoring the upper molars and second bicuspid, on one side.

Countersink in the saddle a Gillmore clasp engaging a U-shaped bar of 14 gauge round wire, one end of which is securely soldered to two Goslee crowns mounted on cuspid and first bicuspid roots, the other end penetrating the saddle, giving it greater stability, permitting a smaller saddle and avoiding the irritation to the interproximal tissues that results when the saddle is extended to engage the anterior teeth on the lingual surfaces.—*A. B. Patterson, Joliet, Ill.*

Management of Cement in Setting a Dowel Crown:—So adjust the chair and the patient's head that the root apex shall be lower than its base. When powder enough is added to the liquid to make a thin mixture scrape half the mass along the slab, out of the way and to the other half add more powder to make a fairly thick gummy mass. Apply the thick mass to the base and dowel coating the latter to its end and the thin mass to the canal and root-end. Push the crown to place without delay.

The thinner mixture acts as a lubricant while the thicker adheres to the dowel and is thus carried quite to the end of the canal displacing the thinner mixture and air which escape at the joint. All the space between metal and root is thus perfectly filled with a cement of the most durable consistency and adherence to the dentin.—*W. C. Gowan, D. D. S., Peterborough, Ont.*

MEMORANDA.

[Society notices will be given insertion in this department free of charge. Subsequent insertions will be charged for at the rate of \$2.00 an inch.]

DR. B. J. CIGRAND APPOINTED.

We learn by the *Western Trade Journal* that Dr. Cigrand, editor of the *American Dental Journal* has been appointed State Director of the Brokerage Loans. We extend our congratulations to Dr. Cigrand, and wish him a successful administration of his office.

DENTIST FOUND DEAD IN OFFICE.

Dr. Wallace G. Stratton, 57 years old, was found dead to-day in his dental office, room 201, 145 North Clark street. The body was lying on the floor, but there were no bruises. Heart disease is believed to have caused death. Dr. Gilbert F. Brown, 5535 Magnolia avenue, also a dentist, found the body, which was taken to undertaking rooms at 2701 North Clark street. Dr. Stratton was a bachelor and lived in rooms adjoining his office. Relatives are said to live in Massachusetts.—*Daily Paper*.

AMERICAN INSTITUTE OF DENTAL TEACHERS.

At the annual meeting of the Institute of Dental Pedagogics held at Buffalo, N. Y., January 27th, 28th, and 29th, 1914, the name of the organization was changed to American Institute of Dental Teachers. The following officers were elected for the ensuing year: President, Fred W. Gethro, Chicago, Ill.; Vice-President, H. M. Semans, Columbus, Ohio; Secretary-Treasurer, John F. Biddle, 517 Arch street, N. S., Pittsburgh, Pa.; Executive Board, Shirley W. Bowles, Washington, D. C., A. W. Thornton, Montreal, Canada, R. W. Bunting, Ann Arbor, Mich.

The next annual meeting will be held at Ann Arbor, Mich., January 28th, 29th, and 30th, 1915.

J. F. BIDDLE, Secretary.

COMPLIMENTARY DINNER TO PROFESSOR FANEUIL D. WEISSE.

A complimentary dinner to Faneuil D. Weisse, M. D., will be tendered by his friends in the medical and dental professions, to commemorate his completion of fifty years as practitioner and teacher, at the Hotel Astor, 45th street and Broadway, Saturday evening, March 28th, 1914, at 7 o'clock.

Those desiring to attend will kindly communicate with the secretary at as early a date as possible.

HENRY SAGE DUNNING, Secretary,
17 East 38th street, New York City.

Committee: W. W. Walker, Chairman, 58 West 50th street, New York City, H. S. Dunning, Sec'y., 17 East 38th street, New York City, J. W. Taylor, Treas., 106 East 57th street, New York City, H. W. Gillett, A. R. Starr, A. L. Swift, R. Ottolengui, W. B. Dunning, E. Hillyer, H. P. Gould, G. B. Palmer, F. W. Saun.

RESOLUTIONS ON THE DEATH OF CHARLES A. MEEKER, EX-SECRETARY OF THE NEW JERSEY STATE BOARD OF REGISTRATION & EXAMINATION IN DENTISTRY.

WHEREAS, in the providence of an All-Wise Creator, our fellow-member, Dr. Charles A. Meeker, died September 8, 1913, and

WHEREAS, His indefatigable industry, his record as an examiner, his skill as an organizer and systematic developer of the New Jersey State

Board work for a period of time covering twenty years, have combined to place him without a peer among eminent examiners;

NOW THEREFORE BE IT RESOLVED, That we, the members of the New Jersey State Board of Registration and Examination in Dentistry, deeply deplore his loss, and express our great appreciation of his long and intelligent services; and be it further

RESOLVED, That a page of our Minute Book be inscribed with these Resolutions, and a copy of the same be sent to his bereaved widow, and to the professional journals for publication.

Herbert S. Stephen, D. D. S., President; Alphonso Irwin, D. D. S., Secretary; William E. Truex, D. D. S., Vernon D. Rood, D. D. S., Cornelius Kiel, D. D. S., Chas. P. Tuttle, D. D. S.

EXAMINATION OF DENTISTS FOR THE U. S. ARMY.

The Surgeon General of the Army announces that examinations for the appointment of Acting Dental Surgeons will be held at Fort Slocum, New York; Columbus Barracks, Ohio; Jefferson Barracks, Missouri; Fort Logan, Colorado, and Fort McDowell, California, on Monday, April 13, 1914.

Application blanks and full information concerning these examinations can be procured by addressing the "Surgeon General, U. S. Army, Washington, D. C."

The essential requirements to securing an invitation are that the applicant shall be a citizen of the United States, shall be between 21 and 27 years of age, a graduate of a dental school legally authorized to confer the degree of D. D. S., and shall be of good moral character and habits.

Acting Dental Surgeons are employed under a three years' contract, at the rate of \$150.00 per month. They are entitled to traveling allowances in obeying their first orders, in changing stations, and in returning to their homes at termination of service. They also have a privilege of purchasing certain supplies at the Army commissary. After three years service, if found qualified, they are promoted to the grade of dental surgeon with the rank of first lieutenant, and receive thereafter the pay and allowances appertaining to that rank.

In order to perfect all necessary arrangements for the examination, applications must be in the possession of the Surgeon General at least two weeks before the date of examination. Early attention is therefore enjoined upon all intending applicants. There are at present 28 vacancies to be filled.

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CHICAGO, APRIL, 1914.

No. 4

LOCAL OR INHIBITIVE ANESTHESIA.

BY W. J. HOGAN, D. D. S., HARTFORD, CONN.

A method of producing such numbness in different parts of the body that operations may be performed without sensation of pain to the patient has been discovered and developed by careful research, study and experimentation by Dr. Wm. H. FitzGerald, a nose and throat specialist of Hartford.

The agent he uses to procure such condition is a simple metal probe tipped with absorbent cotton or thumb and fore finger of operator. This probe is applied with different degrees of pressure to certain areas in either the nose, mouth or pharynx, and it causes anesthesia in the afflicted part of the body. Sometimes the cotton is dipped into a dilute solution of trichloroacetic acid.

Already Dr. FitzGerald has given some few clinics. At St. Francis Hospital before the Hospital Staff as early as November last, he gave a demonstration of his method with most satisfactory results. The physicians saw the specialist anesthetize and operate upon several patients within his own specialty, even going so far as to puncture an ear drum, a most delicate and painful operation, and the patients felt no pain. Other operations were performed by the hospital physicians after Dr. FitzGerald had anesthetized the patients; and the operations were painless and successful. The doctors were much amazed and they testified that the discovery of this local anesthesia was marvelous.

On January 18, four dentists, including the writer, witnessed a clinic given by Dr. FitzGerald. A patient, who had several teeth

to be extracted was anesthetized by him, and when she said she felt no sensation in the jaw Dr. Sears immediately extracted the teeth without pain to the patient. (Figure 1 shows the mouth before extraction and Figure 2 after extraction). Another patient was brought in and when the probe was placed upon different points



Fig. 1.



Fig. 2.

in the nose and throat she traced sensation to different parts of the body. The eye of another was rendered so insensitive that there was no reflex action when the probe was touched to the eyeball.

Blood was drawn with a sharp instrument from the thumb of another patient without any feeling of pain.

I have watched Dr. FitzGerald about ten or twelve times and can now anesthetize my own eye by probing a certain area in my nose so that I do not experience any sensation when the eyeball is touched. I also anesthetized the gum in the region of the lower left cuspid in my mouth so that the doctor punctured the membrane without pain to me.

Wanting to try this upon some one else, I asked Dr. Sears to allow me to anesthetize his gum which I did by a pressure upon the lip. He felt no pain when I lanced his gum. Becoming bolder, with his permission, I anesthetized his eye so that he felt no sensation when pressure was put upon it.

On January 25, we were with Dr. FitzGerald again, and after watching him for some time I became enthusiastic and again anesthetized my own mouth. Dr. McLean punctured the mucous membrane in three places as far in as the alveolar process and I felt no pain whatever.

On January 26, at a special meeting of the Hartford Dental Society, Dr. FitzGerald was present and gave a few demonstrations of his method.

One of the dentists present complained of a headache, and at Dr. FitzGerald's request I cured the headache by applying pressure along the gum as far up as could be reached. The same dentist's lip was anesthetized so that it was punctured painlessly.

With only the aid of Dr. FitzGerald's method a first permanent molar was extracted from a woman's jaw, while she felt no pain. The ear lobe of another woman was so anesthetized, and a tiny instrument was pushed through it.

There were present at this meeting about thirty-five dentists and two physicians, all of whom were interested and enthusiastic, and Dr. FitzGerald was warmly thanked. One very conservative dentist of ripe age, whose name would give great weight to any opinion, said he was glad to have lived to see such a wonderful discovery.

Dr. Edwin Bowers, a well known magazine writer spent several days in Hartford watching Dr. FitzGerald and wrote a lengthy article upon his observations.

The article appeared in the magazine section of *The New York World*, dated December 28, 1913.

Dr. FitzGerald will give a paper before the Connecticut State Dental Association on April 22, 1914, in Hartford and a clinic the morning following.

PUBLIC SCHOOL DENTAL CLINICS A POSSIBILITY IN
EACH COMMUNITY; A PRACTICAL PLAN OF SE-
CURING AND MAINTAINING THEM.*

BY W. G. EBERSOLE, M. D., D. D. S., SECRETARY-TREASURER OF THE NA-
TIONAL MOUTH HYGIENE ASSOCIATION, CLEVELAND, OHIO.

Ladies and Gentlemen:—

I have the honor upon this occasion of representing the National Mouth Hygiene Association, an organization which was formed for the purpose of spreading the Mouth Hygiene propaganda so that the American people might be led to know and understand the importance that Mouth Hygiene bears to the general hygiene of the body.

This organization was formed for the purpose of permitting all people who are interested in this important subject to co-operate in the interest of humanity.

While it is the purpose of the organization to deal with the problem as a whole, we have found it necessary to divide the work into a number of divisions, placing each under a department of its own.

One of the most important divisions of the work is that which deals with the establishment of dental clinics, hospitals or dentariums, where proper care and treatment may be afforded those who are unable to care for themselves; providing not only dental service but furnishing tooth toilet articles which will enable the poor to take care of the "gateway" to the human system in a manner which will permit of the highest development from a physical standpoint.

It is my mission upon this occasion to state that after years of experimentation and investigation we are able to come before this body with the statement that we have evolved a practical plan for the establishment and maintenance of school dental clinics in the various communities throughout the United States.

It is the purpose of the National Mouth Hygiene Association to not only establish dental clinics for the care and treatment of the

*Delivered before the Fourth International Congress on School Hygiene Buffalo, N. Y., August 27th, 1913.

worthy poor, but to raise an endowment fund sufficient to guarantee the successful operation of these clinics indefinitely.

It is impossible in the length of time allotted for papers to be presented in connection with this Congress to enter into a full and complete explanation of the methods to be employed by the National Mouth Hygiene Association in establishing these clinics.

In a nut shell, we will state that the National Mouth Hygiene Association's campaign embraces all that is good in the great campaigns which have dotted this country with beautiful Y. M. C. A. buildings; and also all that is good in the great money raising campaigns that have made it possible to build hospitals, establish dispensaries and erect many of the great philanthropic institutions that flourish in every part of the Universe.

Our campaign embraces all that has meant success in these or other money raising campaigns and in addition it embraces a feature which if employed alone would result in the successful raising of funds to meet the work we are undertaking.

Our campaigns are waged in the interest of the school child and therefore the school child is the hub of the campaign.

The Young Men's Christian Associations are established for the purpose of saving the souls of young men.

Hospitals and philanthropic institutions are for the healing of the sick, the relieving of the wounded, or the care of those who are physically unable to care for themselves.

Worthy institutions these, and I would that we had more of them; but great as is the cause in which these institutions have been erected, greater still is that for which the National Mouth Hygiene Association has been formed.

The National Mouth Hygiene Association stands for the removal of the shackles that are binding the school children down to sin, sickness and death by forcing them into schools where they are surrounded by conditions which, if we accept the statement of the Michigan State Board of Health, is destroying 27.6% of the public school teachers, who preside over these children, from tuberculosis, which is only one of the many diseases that are destroying thousands of lives annually.

The Association is not interested alone in the school child but in the teaching profession as well, and it does not stop there.

It is interested in the health, strength, and working efficiency of every individual in the Universe.

But for the present we must deal with the school child and those interested in its welfare.

The work of the Association is educational, and it employs the four greatest educational institutions—The Public School, The Public Press, The Public Platform, and The Motion Picture. The greatest of these is the Public School, and it is through the school child that we hope to accomplish most.

It is for this purpose that the Association has undertaken to establish dental clinics in the schools of the country.

The National body is not interested in the dental clinic except as an educational feature. The local auxiliary on the other hand is interested in both the educational feature and in the benefit that it will do the community.

The clinic cares for the indigent, dealing with the few. The National Mouth Hygiene movement must deal with all the people, the rich, the poor, and those of the middle class. All walks of life need Mouth Hygiene instruction.

Therefore in the employment of the campaign for raising funds, the plan embraces a method and system which will bring to every individual in the community an invitation to become a part of and contribute to this great movement in the interest of the health, strength, and working efficiency of humanity.

Working in the interest of the school child we work through the school children and a message is carried to every individual in the city and through them an invitation is extended to the individual to become a part of the great movement which has for its purpose the production of healthier and stronger American citizens.

The first move necessary to secure the co-operation of the National Mouth Hygiene Association in your local work is the formation of a local auxiliary to that body in your community.

In accomplishing this end the interested party will find in the early stages that the people most willing to co-operate will be the dentists, physicians and school teachers, and it is from these professions that the foundations must be secured for a successful local auxiliary.

Following the organization of the local auxiliary an application

must be filed with the Secretary-Treasurer of the National body, requesting the installation of a publicity campaign in the community in which such auxiliary was formed. Applications will be filed and acted upon in the order received.

When the Association is ready to operate in any given community the preliminary publicity work will be directed by one of the officers of the National Mouth Hygiene Association, who will visit the city where the campaign is to be conducted in advance of the field Secretary, and it will be his purpose to arouse public interest through the newspapers, from the public platform, and in other educational ways.

That some definite idea may be had as to the manner in which the public interest may be aroused will say that these officials will cause bacterial tests to be made in public places, such as school buildings, street cars, theaters, etc.

He will also make tests in the mouths of the school children, sterilizing mouths and then employing gauze masks, transferring the children and then exposing them in the various public places for the purpose of showing how quickly the sterile mouth may become infected and the various kinds of bacteria that will be found in these mouths after a few minutes' exposure in public places.

Following this will be a period in which the Association employs newspaper publicity.

At this time the Association will send into the field a professional organizer, whose business it will be to raise the money to secure a clinic and endow it for an indefinite period of time.

The preliminary work that this organizer must do is to secure the support and co-operation of the health and educational authorities in the community. The co-operation and support of all municipal and civic organizations must be secured.

Following this the teaching profession of the community must be organized and their support and co-operation obtained.

When this has been done we are ready to start with the financial campaign. This will cover a period of a week of active work.

It is utterly impossible for me to go into full details relative to the organizing and conducting of such a campaign. Let me say, however, that in addition to the solicitation of large contributions the local auxiliary, which has the work in charge, will endeavor

to raise a large percentage of this money by waging the strongest kind of a campaign for membership; the dues to be turned into the general fund.

The membership in the local auxiliary is composed of two classes—"contributing members" and "working members." The first class is composed of those members who make contributions of \$1.00 or more. The second class is composed of those who are not able to make financial contribution but are willing to devote a definite amount of time to the work of the Association in carrying out its plans and policies in the community.

To the latter class belongs the school child in whose interest the campaign is conducted.

Working in the interest of the school child of the community the plan embraces, in so far as practical, the employment of the school children as workers in the field.

The younger children will be used in the distribution of a booklet and other educational matter, making a strong appeal for support of the movement.

The booklet used will be entitled the "Cry of the Shackled Child, A Plea to Aid Mentally Crippled School Children, whose proper development is held back by bad teeth and unhealthy mouths."

This booklet will contain a strong appeal that cannot fail to reach the heart and create a deep interest in the success of the work undertaken.

For the purpose of giving you some idea of the contents of a booklet of this kind I beg to quote the following extract, which is taken from the inside of the front cover:—

"This booklet has been placed in your hands by a school child. In justice to your juvenile friends and relatives, the least you can do is to read it.

"Educators, clergymen, civic workers, city officials and all other public spirited citizens have approved the movement it promotes.

"At any rate, it will present some facts to you that will surprise you and take only a few minutes of your time in reading it.

"In a few days you will be called upon to aid this great work by becoming a member of the National Mouth Hygiene Association's

local auxiliary. You can help materially by giving the young solicitor courteous attention. If you cannot see your way clear to join the children, at least do not dishearten the child who calls upon you by an abrupt or harsh rebuff. He is working for humanity and certainly deserves encouragement."

This booklet explains fully the purpose of the campaign and the need of co-operation.

A day or two following the distribution of these booklets an older child calls soliciting membership in the local auxiliary, collecting the fee of \$1.00, and issuing a membership card which in addition to calling for educational literature contains a coupon which, when presented at any drug store in the city, entitles the bearer to a full "Dollar's worth of tooth toilet articles."

The booklet which has been distributed explains to the individual, whom the child solicits, that the National Mouth Hygiene Association has placed in operation a plan which makes it possible for its local auxiliaries, that are conducting campaigns, to buy and place in the hands of their members packages of the highest grade of tooth toilet articles, which ordinarily retail for \$1.00, and by the transaction be able to set aside 50% of the membership fees for the endowment and maintenance of dental clinics.

These membership packages contain four large tubes or boxes of tooth paste or powder, such as ordinarily retail at 25c per tube or box.

These "four tube" or "four box" packages are supplied to local auxiliaries in a manner which enables them to place same in the hands of the druggist at a cost of about 40c per package. The druggist is allowed 10c per package for reclaiming the membership coupons. This makes the "\$1.00 membership package," delivered to the member, cost the local auxiliary 50c.

The new member for the \$1.00 paid, receives a full membership in the local auxiliary and a "\$1.00's worth of tooth toilet articles"; and by the transaction places in the hands of the local auxiliary the profit which otherwise goes to the manufacturer of tooth toilet articles. In this case the profit amounts to 50c on the \$1.00 and is retained in the community and devoted to endowing and maintaining school clinics.

The National Association has also arranged a plan whereby

the same tooth toilet articles may be supplied through the regular commercial channels on a basis which will enable the community to reap the benefit of the profit from such sales.

This is done by the placing in the carton of each 25c package a metal disc, which when collected by the local auxiliary, entitles that organization to collect 5c for each disc to be used in its local work, or in maintaining dental clinics.

The difference between the profit accruing to the auxiliary from the "\$1.00 membership package" and the four 25c packages sold through regular trade represents the difference between supplying large quantities to the local auxiliaries at cost and the commercial and overhead charges in handling these goods through the regular commercial channels.

This is a co-operative method which permits the people in a community to turn the profit that now goes to the tooth toilet manufacturers of the country into a local fund for the purpose of not only establishing school dental clinics and other clinics, but supplying tooth toilet articles to the poor of the community. Such a plan would enable these individuals to have at their command methods and means to care for themselves in a manner which would permit them to reap the benefits of healthy mouth conditions and thus remove the possibility of their becoming a public menace through neglect or inability to care for the mouth properly.

In order to give some idea of the tremendous profit that accrues from the manufacture and sale of these articles, I wish to say that some of the leading manufacturers have been and are paying as much as from five to seven thousand dollars an issue for the back cover page of some of the most popular magazines.

I can readily understand that immediately within the mind of the skeptic or doubter there arises the question of graft or the attempt to advertise some tooth toilet article; but I wish to announce to the world at large that the plan has been drawn and safe guarded in such a manner as to make it absolutely impossible for any one associated with the National Mouth Hygiene Association or any of its auxiliaries to receive one penny of profit or graft from the transaction.

I wish also to state in the most emphatic terms that no manu-

facturer of tooth toilet articles is directly or indirectly interested in the promotion of this plan.

There are four things which have led to the adoption of the plan herein suggested:—

First: The need of funds to carry on the work of the Association in the various communities.

Second: The success attained in raising funds for Y. M. C. A. buildings, hospitals, dispensaries, etc.

Third: The popularity and success attained in raising funds through the sale of Red Cross Stamps.

Fourth: The fact that the National Mouth Hygiene Association's campaign is unique in that every effort put forth to educate the public as to the importance of Mouth Hygiene creates a demand for tooth toilet articles.

In adopting the plan for supplying tooth toilet articles as herein outlined, the Association has combined the raising of funds and the supplying of a need; and it is believed that this feature will become as popular and more effective than the Red Cross Stamp feature of the Anti-Tuberculosis League.

In conclusion let me say that the whole success of the plans and policies mentioned herein depends both upon the employment of thoroughly competent experts in the different lines of work and upon the presentation of the matter in a way which will convince the public that this is absolutely a philanthropic and economic proposition.

The National Mouth Hygiene Association has undertaken to do this work in the interest of humanity and it guarantees that every step taken and every act committed will bear the most rigid inspection and investigation; for upon the honesty of purpose and purity of action must rest not only the success of the scheme but the good name of the Association and those associated with it.

In presenting this paper for the consideration of the general public I wish to acknowledge the aid and support given by the Board of Governors of the National Mouth Hygiene Association; and particularly that of Dr. T. W. McFadden of Wilkinsburg, Pa., who has been conducting a series of experiments as to the efficiency of the proposed plan for raising funds from the sale and distribution of tooth toilet articles. The work done by Dr. T. W. McFadden and the results obtained have been simply marvelous.

SEVENTY YEARS IN DENTISTRY.*

BY DR. ARTHUR HOLBROOK, MILWAUKEE, WIS.

Mr. Toastmaster, Ladies and Gentlemen: It is a proud and crowning moment of my professional life to stand here as a guest of the dentists of my state and, in the presence of these noted men—including the very dean of my profession, to receive the greetings, and the tokens of regard tendered to me this evening.

It is a pleasure to unite with you in your greetings to one who has honored his profession, his city and his state by long years of faithful service and splendid achievement, and it is an especial privilege to stand by Dr. Maercklein's side and receive with him this generous testimonial.

This gathering and this greeting are significant. The gathering is significant of the progress in the profession of dentistry. The greeting is significant that recognition is given to men who have devoted a lifetime to the practice of dentistry.

Emerson wrote: "The crowning fortune of a man is to be born to some pursuit which finds him employment and happiness, whether it be to make baskets, or broadswords, or canals, or statues or songs."

In my own case, a lifetime of more than three-score and ten years,—with the exception of two years' army service in the Civil War—has been intimately and continuously associated with dentists and dentistry.

Among articles I have carefully preserved is a printed announcement issued in 1840 and signed by a score of prominent citizens of northern New York, among them my father's preceptor and four practitioners of medicine, recommending my father as "a young man of good moral character and well skilled in the profession of dentistry." As this was about the time of my birth I may claim the honor of being a child of the profession.

The years of my pupilage have never ended and it will be difficult to designate the date when I emerged from the long apprenticeship, but on May 1, 1863, I made my first entry in an "All-

*Read at a testimonial banquet to Drs. Arthur Holbrook and B. G. Maercklein at the Pfister Hotel, Milwaukee, Wisconsin, January 21, 1914.

port" ledger and marked my first fillings upon the diagram as an independent dental practitioner. A diagram record of operations has been continuously kept for fifty years.

For seventy years dentistry has been entitled to rank as a progressive profession. From 1840 we can date its claims as a science, for the movement then started to establish it upon a foundation of solid, logical principles. This date is of double interest to me, for it is also from the "forties" I date my association with the profession.

This seventy years with dentists and dentistry has witnessed an entire revolution in the practice. Previous to that time dentistry had been simply a secret art and was hardly entitled to professional distinction or to be classed as a science. Each practitioner was a law unto himself. Instruction in the art was very limited, and generally very expensive. Mechanical dentistry outranked the operative. About 1838 began the advancement of a higher professional sentiment. Conventions and meetings were held and on August 18, 1840, in New York City the first regularly organized society of dentists in America was formed, and in that same year the first college for dentists in the world was opened in Baltimore.

The machinery so common now was entirely unknown and undreamed of then. Steam and electricity had not yet made their important contributions to our profession. In my cabinet are a few home-and-hand-made instruments nearly seventy years old; the steel for some of them was turned and tempered at a neighboring forge; the wood for the handles taken from a neighboring sapling, seasoned, turned and stained by my father. I can distinctly remember the pride with which they were first exhibited to a waiting public.

The office was always in the home with the family, so that members of the household were frequently called upon for assistance. It became one of my duties at a very early age to care for the instruments, and I have been reminded in later life of my faithfulness in that direction, for that was more to my taste than some of the other duties assigned to me at that period. Another way of employing my youthful powers was sending me to the foundry for molding sand, assisting with the molds and the everlasting burnishing of metallic plates. The rub, rub, rub with

Scotch stone and water on a gold plate was monotonous, especially when the skies were clear for play and the boys were calling.

Forceps were scarce and not generally relied upon in those days. The turnkey was the triumph of surgical ingenuity and the torture chamber, and it was the terror of the populace. When that was applied something had to come. Generally in hard, lower cases the patient was seated upon the floor and the head was held firmly in the lap of the family assistant. A red handkerchief was wound about the shank and handle for protection to lips and jaws and then—the fun would commence.

Occasionally I assisted in the manufacture of amalgam by simply flogging a silver—Spanish or Mexican—dollar into particles, when after using a magnet to collect iron or steel particles in the mass it was ready for the mix. Some of the fillings made from those filings were intact and serviceable after fifty years' wear.

Saliva control was a problem which frequently baffled the gold and tin operator and helped the amalgam business.

My services were often called upon for assistance at the forge, in fusing and rolling metals for plates, casting dies, turning hand lathes, and many other such interesting operations. Gold and silver were then the only bases for full or partial dentures, and "full sets" were supplied with retaining springs when ordered.

Prevention was a problem in those days as well as now, and filing between teeth to assist in cleanliness was a frequent practice.

Attaching porcelain crowns to roots with pivots made from seasoned hickory was a general practice that lasted until the introduction of metallic posts. The whittling and shaping those wood pivots was one of my early experiences.

These were memorable days for me, and, as time has given me this life experience with dentistry, I recall the old days as old friends who have affected my future. I left the paternal roof and came to Wisconsin to commence my life work, and only at intervals was I again permitted to watch the work of the one who started my career. He rests after long and faithful service to others.

In 1840 it was a most difficult thing to gain information regarding the practice of dentists. Every dentist guarded his office and his laboratory with the greatest secrecy, and there were no laws to regulate his practice.

It is doubtful if at that time there were eight hundred practitioners in the entire country. Wisconsin was then a territory, with about 30,000 inhabitants. Milwaukee was a village with about 1,500, including Indians. The name and the time of arrival of the first dentist in the territory and in Milwaukee is in doubt. Old settlers disagree but it is generally conceded that Dr. R. J. Faries was among the first to arrive. In 1872, the year I came, Milwaukee had a population of about 75,000—and there were eleven dentists.

In 1840 the one solitary dental college of the world had just opened its doors, and not until 1841 was there a graduate of a dental school—and then only two: Dr. Robert Arthur and Dr. R. C. Mackall of Maryland. The faculty was composed of graduates in medicine.

As late as 1867,—so far as I can learn—there were but two graduates accredited to Wisconsin: the late Dr. Charles C. Chittenden and your speaker.

From one small society in the United States there has grown during these seventy years our complete system of national, state, district and local societies covering every section of the country.

In 1840 the first periodical in this or in any country devoted exclusively to the interests of dentistry completed its first volume. The publication of "*The American Journal of Dental Science*" was commenced in 1839 and was issued monthly; its publication later on was suspended. "*The Dental News Letter*" from its first number, October, 1847, to the present has continued under one proprietorship; it was started by Jones, White and McCurdy—the leading dealers in dental supplies—as a quarterly. In 1859 it was changed to a monthly and became the present familiar *Cosmos*. It is the only dental journal now published which has appeared under one management since 1847. It is my good fortune to possess a complete file of *The Cosmos* from its first number in 1847 to the present, and to this library containing a full and faithful record of contemporaneous literature and to the "History of Dental and Oral Science in America" published in 1876, I am indebted for many of the statements I here make.

In 1840 values were not forgotten; gold was standard then as now, at about the same price. Porcelain teeth were just coming into use; they were plain and single and were generally kept in

bottles. Gum sections came into use shortly after the introduction of rubber base about 1857. About 1840 the gum colors of mineral teeth were improved to more resemble the natural. Up to that time the principal duty had been to remove and substitute. There was little parleying, with a swollen face or with an aching tooth in those days; if leeches or some radical application would not bring relief, the turnkey would.

Machinery in dentistry was almost unknown. Grinding was done by hand, and drilling by the hand or by the aid of the old cumbersome bow, or spring stock drill, or the finger ring and drill socket. Chairs did not have elevating mechanism, and there were no telephones to distract or disturb the attention of the operator.

The dental supply houses and agents were scarce; we know where to find them now, and often to our sorrow the agent knows where to find us, and how to tackle us. In the old days to get a book of foil or some teeth to a country town was the work of days and often weeks. The post was not only slow but expensive, and the postage could be collected from the recipient at the end of the route if the sender so chose. Postage stamps and adhesive envelopes were unknown then. I have letters in my possession with huge wax seals, sent only a few miles in 1840, with twelve and one-half cents due, to collect; and one from Milwaukee, for which my father was obliged to pay twenty-five cents in New York, before it would be delivered. Thus it often occurred, the person addressed would not pay the postage due, so in an old advertisement of Jones, White and McCurdy they make the following announcement: "If customers will prepay their letters to us we will prepay ours to them."

Present day dentists who are equipped with diplomas—and their offices furnished with telephones, electricity, dental literature and every conceivable form of instruments, appliances and modern conveniences to facilitate and to lessen their labor, can form only a limited idea of the prevailing conditions, and of how dentistry was practiced by my father and his contemporaries seventy years ago.

It will not be possible at this time to enumerate or to arrange in a chronological, an alphabetical, or even in a discriminating order, the additions and the changes that have come; but in order to give emphasis to the progress and to present day methods I re-

quested a number of active practitioners to indicate the most important matters pertaining to dentistry.

Gold, silver, tin, lead, beeswax and porcelain were the only things mentioned that remain to us from the "thirties."

Plaster of Paris did not come into use until about 1845, and gutta-percha not until 1848.

Tin has remained of value to many practitioners to the present. Lead and zinc continue useful in castings.

Anesthesia did not come until the forties, when Dr. Horace Wells, a dentist practicing in Hartford, Connecticut, in 1845 gave to the profession and to the world nitrous oxid gas.

Another dentist—Dr. William G. Morton—in October, 1846, first administered ether to a patient in Massachusetts General Hospital.

Chloroform was introduced by Sir James Simpson, a Scotch surgeon in Edinburgh in 1847.

Gold has been so changed in various ways for operative work that it would be amusing for us to watch the old practitioner in his attempts to use it, and with what bewilderment would that old practitioner of seventy years ago view the developments in dentistry that have come since his day! Among a thousand new things he would find:

Colleges, text-books; literature; ethics; examining boards; societies; fraternities; establishment of a section on Stomatology by The American Medical Association; establishment of the Army and Navy dental corps by the United States Government; endowment of institutions for research work; dental examinations in public schools; free clinics; anesthesia; analgesic compounds; obtundents; cocain; the dental engine and motor power; electrical appliances; mallets; furnaces; cauteries; lamps; Roentgen ray; bacteriology; treatment for pyorrhea; scientific pathology and therapeutics; prophylaxis, and the inculcation of preventive treatment; orthodontia; oral surgery; treatment of cleft palate; the regulation of teeth for better articulation, for improvement of speech, facial expression and correction of nasal obstructions; root pressure to stimulate regeneration or growth of bone; rubber dam and the various saliva controllers; gold in a hundred forms for all requirements, with instruments especially adapted for each form; plastics in endless variety;

gutta-percha; cements; improved amalgam; the "discovery" of the "place" and the "value" of the plastics; contour and contact fillings; the principle of "Extension of Cavities" and of "Extension for Prevention" in operative work; separators; forceps; block teeth, and shaded gums; porcelain and jacket crowns; porcelain and gold cast inlays; disappearing wax models; bridge work and banded crowns; plaster of Paris and modeling compounds; interchangeable facings; posteriors with made up backings; detachable pin-crowns; casting processes for metal in crown, bridge and plate work; compressed air outfits; pressed steel cabinets, marble switch boards; sterilizers and aseptic appliances; and finally, what would our old practitioner say to the "rest cure" in laborious operations where you press the button and some one else does the work—in other words, the modern, thoroughly equipped and up-to-date manufacturing laboratory where a master hand gives aid in the most puzzling and trying complications, and from the simple impression assumes the detailed work of the operation and relieves the operator of the major part of labor, annoyance and anxiety by returning the denture, the inlay, the appliance, or the product desired, in a complete and finished form for delivery.

The work of the past was principally to remove and substitute. The work of the present is to relieve, restore, strengthen, preserve and beautify; and now with his modern outfit, there are few cases—if any—so complicated, so intricate, or so stubborn in dentistry, that can not be met and conquered by an intelligent, a faithful and progressive operator.

What changes have come during the past seventy-five years; so many that it does not seem possible to my mind that such radical changes can ever come to dentistry again during a similar period of time.

The experience and the genius of men have made it possible in the measured space of a lifetime, to mold and to bring into existence a great profession. What will the future bring? The man who will attempt in these days of progress to practice dentistry individually should forfeit his title.

Some one has said, "the weakest spot in every man is when he thinks himself the wisest." It is idle and presumptuous for a man to rely upon his college training, his books or his periodicals

as a guarantee of his ability to meet the requirements and to practice his profession unaided.

Dentistry has taken rank with the great professions and it is the plain duty of every dentist who desires that this high rank be maintained to come into line and to work with his colleagues for the welfare of the entire profession. A practitioner of dentistry can ill afford to stand aloof or alone in these days of wonderful, professional achievement—or to withhold from his fellow worker his fellowship and his friendship. United effort is imperative, and the coming together this evening of representatives from all sections of the state irrespective of society affiliation, length of service or theories marks a period in the history of dentistry in this state that ought to be an inspiration and encouragement to those of us who have long been striving for a united, coherent profession.

It is a grand occasion and a grand time for pledges to make the profession in this state a leading power.

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If this is the "crowning period" in the history of the profession, it is also a crowning period for one whose life has witnessed the advance and he should give thanks that he has lived to witness these wonderful achievements.

The retirement, however, from an active part at this crowning period in dentistry brings occasional longings for youth that a start might now be made, with the profession firmly established, and with the conveniences and advantages of twentieth century standards and ideals.

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And now the time for respite has come; the cessation, however, is not from choice; and with a forced retirement, come visions and anxieties that make the parting a solemn act.

It is however with the most sincere pride and pleasure that a life work in dentistry can be crowned by the hearty greeting, and the loving remembrances of his brethren.

The intenseness, the anxieties and the toil of the many years' service are so richly rewarded by this testimonial of gathered friends that words can not tell of the gratitude of the heart, or give utterance to the emotions, or to the pride that overpower me.

"The crowning fortune of a man" when his life pursuit has ceased, is the love and regard which are so generously manifested here to-night.

It is indeed a proud time in my life that I can receive such evidences of friendly and professional regard.

The memory of this evening will ever brighten my life and soften and strengthen my remaining days.

I tender to you one and all my heartiest thanks, with my best wishes for your future.

RESPONSE TO TOAST.*

BY DR. B. G. MAERCKLEIN, MILWAUKEE, WIS.

You have sent on the wings of lightning, a messenger of love, to recall the wanderer from a distant state, to return to the field of his labor, for more than sixty years his only home, beautiful, progressive Wisconsin. That message had the same effect as the melody of "Home Sweet Home" on the ears of the exiled wanderer traveling in foreign lands, and with tear-dimmed eyes, I exclaimed with the wanderer, "Ere I die, whate'er betide me to thee, Wisconsin, I'll return again," and memory goes back, more than forty years, to the beginning of my professional career; (I will draw the curtain of oblivion over my early struggles).

In 1875 I attended the meeting of the Wisconsin State Dental Society for the first time, and the solicitude of its members to make me feel at ease, and stay with them during the entire session, has endeared that Society to me forever. No one can ever compute the beneficent influence of that meeting, Dr. Marshall H. Webb, of Lancaster, Pa., the skillful operator of cohesive gold, the persistent advocate of contour filling, gave a demonstration of his methods and like the soul of "John Brown's Body," his Soul goes marching on forever.

In 1876 on account of the World's Fair, and possibly some indifference of its officers, no meeting was held. In 1877, the Society was resuscitated, and a meeting called and held at Madison, Wis-

*Delivered at a testimonial banquet to Drs. Arthur Holbrook and B. G. Maercklein, Milwaukee, Wis., Jan. 21, 1914.

consin. During its sessions we were invited to spend a social evening at the home of Dr. C. C. Chittenden. A small but enthusiastic number spent a most enjoyable evening, and in the exuberance of our spirits, we, individually, pledged ourselves that we would do everything in our power to promote and enhance the welfare of the Wisconsin State Dental Society, and maintain the dignity and elevate the dental profession. Paradoxical as it may seem, I an infant in the profession, became one of its foster parents.

From that time until 1909, I have not missed a single meeting. I have steadfastly held to our colors, and fearlessly advocated whatever I considered right though the entire profession might be against me; and when defeated, I have never relinquished my trust, but Phoenix like risen from the ashes, with renewed vigor, renewed energy, renewed enthusiasm, and methods, and persistency pursued our object until success crowned our efforts. Divided grief is half grief, but divided pleasure is double pleasure. I assure you, Gentlemen, that it is a double pleasure to me that my friend, Dr. Holbrook, the only remaining charter member of the Wisconsin State Dental Society, divides the honor with me to-night. Since that memorable meeting at Madison, they have planted many a slab of marble so gray, and our co-workers lie under the stone, and I can say in the words of the poet, altered slightly to suit the occasion, "and of all of those that were co-workers then, there remains Dr. Holbrook, but you and I."

Gentlemen, you have found the one vulnerable spot, you have touched my heart, you have overwhelmed me with an avalanche of kindness and placed me "hors de combat."

You have dropped your chisels and mallets and pluggers. You have come from near and from far, to join hands in one grand harmonious effort, to publicly stamp the "insignia" of approval on our works, the highest honor that you can confer upon us. Oh had I a thousand tongues, words would still fail to adequately express the gratitude that I feel in my heart for the honors that you have so generously and magnanimously conferred upon us to-night. I will therefore use the simplest words in my vocabulary, assuring you that they are sincerely spoken and come from the most grateful heart, I thank you, I thank you, I thank you—and may God bless you all.

AMELIORATION OF PAIN IN DENTAL OPERATIONS.*

BY C. M. CAHILL, PH. G., D. D. S., CHICAGO, ILL.

Mr. President: Members of the West Side branch of The Chicago Dental Society: I realize that the mere mentioning of the drugs, remedies or agents used—and quite properly so—in the relief of pain during dental operations, to say nothing about their discussion, would require all evening. Hence, as briefly as is possible, I will mention those agents whose results to me have been pleasing and beneficial, hoping that in the discussions to follow there will be brought out more about them, as well as additional agents, to the end that we may all be benefitted thereby.

In my opinion, a paper preceding this one dealing with the etiology of the factors producing pain, i. e., their physiology, histology and pathology would have opened up a larger field for discussion and proven very beneficial.

In order to more easily combat him, I have divided the great bugaboo of the dental profession (viz. Pain) into “three grand divisions”—as in Geography, we used to say—Psychological, Mechanical and Therapeutical.

Psychological: Much has been spoken and written of the “Real and the So-called Diseases of Dentition.” In my opinion, much may be said of or about the real, as well as the so-called pains of dental operations. All of the so-called and many of the real pains, in my opinion, can be successfully treated psychologically. For example, there’s the “I just hate the dental engine;” the “I simply can’t let you touch that tooth;” the “I faint if you use that nasty rubber” and so on ad. lib. It is obvious, though very strange that pain is very easily forgotten. Eliminate fear of pain from the mind of your patient and you eliminate the greatest obstacle in the way of successful operations, and happiness for both patient and operator.

It should be your pleasure, as well as your privilege, to teach your juveniles to get music out of the whiz of the engine and burs. To bolster up Johnnie because “He’s a soldier, and only girruls cry;”

*Read before the West Side Branch of the Chicago Dental Society.

to appeal to Mary's pride, so that she submits quietly in order to be as "beautiful as is her Mama, or her Aunt Lou."

"Ah!" but you say, "How about your Adults?" How about them indeed? Those whose long tenure of years, coupled with the exchanging of harrowing experiences—some of them actually having "died several times in the dental chair," will not only test your every ability but often wear out your seemingly inexhaustible supply of patience.

Inexplicable as it may seem, in my opinion, it is true that trying to simplify matters by much explanation to the patient succeeds inversely to the amount of neurosis. I mean this—for the most part we have forgotten the Senior Student idea that it is necessary to explain in minutia our every operation. I firmly believe that the more nervous your patient, the further you get from the goal sought by much explaining.

This may seem, gentlemen, like a bit of preachment, yet I believe that you will all agree with that to which I am leading. On the street and elsewhere, we hear the expression, "I like that fellow—He delivers the goods." Boiled down, it might be said of him, he's always a positive, never a bundle of negatives. Self-assurance, gentlemen,—a far cry from egotism;—confidence in one's ability to carry forward to a successful completion that which he is about to undertake, is of prime importance. This is a something one can not "get" as is said of "getting religion," and "the measles." It certainly can not be handed to you along with your diploma. As Dr. Holmes has said:

"And with this object, settle first of all
Your weight of metal and your size of ball."

Very often an uncertain patient faces an uncertain—to say the least—a wondering operator. However, with a comforting knowledge of yourself, extreme firmness—not to the point of unkindness,—but with positive assurance on your part that "you won't let the chisel slip," and you "won't drill into the pulp," proceed with the indicated operation. Having given the patient this assurance, take an Irishman's advice here, and "raymimber whatever you do do, don't do it," and as a result of your poise you will find a quiet, pleased patient and from the point of real pain, one whose endurance will astonish.

AMELIORATION OF PAIN IN DENTAL OPERATIONS—MECHANICALLY.

Sharp instruments, instruments of proper pattern and properly handled are great pain relievers. I wish to lay special stress on the term SHARP. A dentist has no better friend than Mr. Sharp Bur. When the remark is made—"That other dentist took so long and hurt so terribly while grinding out my tooth," you may pretty safely guess that some of those burs dated their origin back to the time he received his sheepskin—and I don't mean State Certificate, gentlemen, which, in this State is renewed every two years.

In a most conspicuous place, i. e., in plain view and very close at hand should be an Arkansas stone, and it should be used daily. By the terms "instruments of proper pattern," I mean proper shape and proper angle. In the removal of dental caries, using whatever instrument you will, the blade should be of sufficient width to practically lift the decay in its entirety "with one well directed blow" as is said at the ringside. In my opinion, the angle at which an instrument is held, and upon which pressure is exerted has some influence on the amount of pain produced. I wish here to pay my regards to the separator removed hurriedly, because it is luncheon time; the carborundum or corundum stone that is sure to strike tooth surface twice in one revolution, and that pernicious little devil that is used to decapitate, amputate or otherwise disfigure the roots of the six anterior teeth, and known as "the root reamer." Woe betide the individual who tries any of these three on me. It sometimes becomes necessary to take accurate impressions of the superior and inferior maxilla, incident to the procedure of extracting from the patient all one can for a pair of dentures. While in an office a few days ago I was informed by the dentist that he had had more trouble getting impressions of a certain patient than he had ever experienced. "Hurt her so to get the impressions." Upon investigation I found the office had for some years boasted of two full upper and one full lower tray.

Teeth too sensitive to endure pressure of burs, drills, instruments, etc., due to abscessed conditions, to pericemental inflammation; teeth loosened through pyorrhea, salivation or recession of supporting tissue, and that you fear will not endure the pressure you desire to place upon them may be immobilized by use of modeling compound packed around two or three approximating teeth.

AMELIORATION OF PAIN IN DENTAL OPERATIONS—THERAPEUTICALLY.

This is a subject so broad that it could scarcely be covered in a year's collegiate course. Briefly as possible, therefore, I shall mention a few of those agents that have either in my hands or from observation at the dental clinics or both, proven beneficial. I am sure the discussion following will add greatly to the list.

For the relief of pain in hypersensitive dentin, a combination of phenol, thymol and camphor, plus a little warm air, has proven a very satisfactory anodyne in my hands. Where the esthetic side need not be considered, silver nitrate is a very valuable agent. However, unless the cavity can be thoroughly dried and ket so and exposed to light rays five or ten minutes the procedure is a useless one. On rare occasions patients will present with shallow cavities, nowise endangering pulp tissue, and yet so sensitive as to render proper cavity preparation impossible, after one has tried every anodyne at hand.

I find after sealing these cavities for a short time with an oxyphosphate of copper cement, cavity preparation is easy. The "despair and hope as well" of the dental profession, that first permanent molar, comes to us most frequently in such a condition that in the removal of the caries we fear an exposure of the pulp. We fear far more the attitude of, and effect upon the child mind. Here the caries is saturated with all the chemical elements that saliva and food stuffs can afford. A pledget of cotton saturated with the anodynes Phenol, thymol and camphor placed in the cavity and volatilized so as to thoroughly permeate the carious dentin will permit its removal with little or no pain. A trial will prove to a certainty that it hurts to force a size No. 7 foot into a No. 5 shoe. In the extirpation of the dental pulp and root canal contents, this is a somewhat similar procedure. By dipping the broach in a solution of thymol one will avoid much of the pain.

Where devitalizing paste that contains arsenic is left in a tooth too long, with a resultant inflammation so great as to render operative procedure very painful, immobilize the tooth, or ligate and hold firmly while opening into the pulp chamber. Remove pulp and carry a drop of oil of cloves into the root canals. Volatilize thoroughly. Place a pledget of cotton moistened with this agent in the pulp chamber and volatilize with a hot ball burnisher. With

temporary cement, seal a small quantity in the pulp chamber for a few days. For Arsenical Pericementitis, gentlemen, this drug is a specific and no other drug compares.

Phenol, thymol and oil of cloves are anodynes that produce on sensitive dentin analgesia pleasing and satisfactory. Phenol compound (Buckley) is a very pleasing and efficient local anodyne.

I am neither a prophet nor the son of a prophet, hence should not attempt to write the final chapter on Nitrous Oxid Analgesia. However, and in conclusion, from my observation of the results of its use, I am of the opinion that whilst its effect momentarily is very gratifying, in the final analysis the results are not sufficiently satisfactory to warrant its use.

THE FUNCTION OF THE DENTIST IN RACE BETTERMENT.*

BY C. N. JOHNSON, M. A., L. D. S., D. D. S., CHICAGO, ILL.

A consideration of this subject calls for a study of the significance of the teeth and mouth as factors in individual and community health. We are rapidly learning the lesson that to better the race we must better the individual, and if we are to better the individual we must add to his physical, mental and moral efficiency. It has long been recognized in a general way that the condition of the teeth has much to do with the health of the individual, but not till recently has the direct relationship between oral hygiene and bodily health been definitely and undeniably traced. We all acknowledge that a poorly nourished body must result in inefficiency, but we have not always studied with sufficient care all of the causes or all of the results of faulty nourishment. This question concerns us most in growing children—not in the growing children of the well-to-do perhaps, so much as those of the great mass of humanity who today are everywhere—particularly in our large cities—being gradually assimilated into our future citizenship.

Let one of these growing children be afflicted with decayed and neglected teeth, what is the result? To say nothing of the suf-

*Read before the National Conference on Race Betterment, at Battle Creek, Michigan, January 8-12, 1914.

fering which frequently follows with its long train of perverted function and incapacity, we have the immediate result of inefficient mastication. Without mastication we cannot have good digestion, without digestion we cannot have assimilation and without assimilation we cannot have nourishment. Many a child is starving for lack of the necessary apparatus with which to properly prepare the food which is placed before him. And the damage is not merely negative—it may become very positive. The child who is illy nourished intuitively develops a craving for stimulants. Observation has demonstrated the fact that these poor children who are suffering from defective teeth and cannot masticate will consume enormous quantities of coffee or tea if they can get it. And it is not fanciful to go one step further. It may seem a far cry from defective teeth to drunkenness, and yet it is a possible and a perfectly logical sequence. We are not giving these children a fair chance in the world for place, preferment or race betterment if we permit them to grow up with faulty mouth conditions.

Not only this but there is a quite unsuspected and a very real danger to the individual and to the community as the result of defective teeth and broken down roots left in the jaws. The inevitable abscesses from these roots discharge large quantities of pus to be taken up in the circulation or carried into the stomach or lungs, creating a constant poison which should no longer be ignored. A general infection of the system sometimes results from an abscess on a single tooth, and it is not unusual to have a life lost from this cause. These decayed cavities in teeth also form an ideal culture place for pathogenic micro-organisms, which are a constant menace to the individual as well as to others with whom the individual comes in contact. Cook of Chicago demonstrated the tuberculosis bacillus in the roots of pulpless teeth and traced it down through the jaws to the glands of the neck. There is no question that there have been direct tuberculosis infections from this source. One writer has gone far enough to say that 95% of tuberculosis is due directly or indirectly to faulty mouth conditions, that aside from the cases of direct infection from the roots of teeth there are the numberless other cases where the system is rendered susceptible to tuberculosis through inefficient mastication and its consequent train of evils. We all know that the significant thing in tuberculosis is the

factor of susceptibility—that practically every individual is exposed to the tubercle bacillus at one time or another on account of its almost universal existence, and that the reason some people escape its ravages is because of their resistance to its encroachment. Let an individual be illy nourished or “rundown” as the phrase is, let the system be impoverished through faulty assimilation so as to develop a lack of tonicity, and the inevitable result is an increased susceptibility to an attack of tuberculosis. The tubercle bacillus seeks a field where the tissues are lowered in tone, and its invasion is usually the result of a lessened resistance through bad air and lack of proper nourishment. Reasoning from this it is not difficult to connect this disease in its incipency with defective and diseased teeth.

In the public schools of Chicago there was at one time an epidemic of scarlet fever. The health department quarantined every child afflicted with the disease the regulation time, and yet scarlet fever kept spreading. It was noticed that immediately following the return of the quarantined children to school new cases developed among their associates and it was clear that in some manner these children were spreading the disease even after they themselves had long since passed the infective stage. It occurred to the then Commissioner of health, Dr. W. A. Evans, that there could be only two ways in which this might happen—the child might carry the germs of scarlet fever indefinitely in the tonsils or in the cavities of decayed teeth. His first order was that no child who had suffered from scarlet fever should be permitted to return to school till all decayed teeth were filled and the mouth made hygienic. Immediately scarlet fever was stamped out of the Chicago schools. Precisely the same thing happened in the public schools of Valparaiso, Indiana. Dr. Nesbit the health commissioner succeeded through a similar regulation in arresting an epidemic of scarlet fever which had persisted for so long a period that it had practically paralyzed the school system of that city.

These instances are only the merest hint of what might be written on the relationship of defective teeth to the community health, but they must suffice for the present occasion, with the passing statement that nowhere in all the realm of medicine is there a more important question than this of oral hygiene or oral sepsis.

If, then, defective teeth are such a prime factor in physical inefficiency it may be well for us to consider briefly the prevalence of this affection. Few people have any conception of the relative number of children who are growing up with bad mouth conditions which prove a handicap to themselves and a menace to the community. In an examination of the teeth of school children in various communities it has been found that at least 90% of them have decayed teeth. In the public schools of Chicago where nearly 70,000 children have been examined the percentage runs much higher than this. During the month of November, 1913, there were examined 2,231 children, of whom 2,224 were found with defective teeth. When only seven children out of 2,231 in a given community are found with perfect teeth it is surely time that our civic authorities and our boards of health give some heed to this important matter.

In conducting ten free dental infirmaries in the public school buildings of Chicago where the teeth of poor children are cared for we are brought face to face with the appalling enormity of the need of this service. The waiting lists of children seeking relief, and the verdict of the school principals where the infirmaries are in operation are sufficiently striking to impress even the casual observer with the significance of the work. One principal writes:—"We are very enthusiastic over the benefits derived from the work done by the dental dispensary in this school. So far this year, emergency cases and very badly neglected cases have kept the dentist busy every minute of the school day. Needless to say the improved physical condition of these children has helped them to accomplish more in the school room."

Another one says:—"I think there is no question about the need of this dental work in the schools and the good that the service is doing. We find that practically all of the children need attention, and that very few of them have received any. Formerly I had to send many children home with toothache. Now I send none."

This gives me the opportunity of remarking parenthetically that if our school boards would spend one half the amount in a campaign for the amelioration and prevention of disease that they now spend annually for teaching the "repeaters" who are made such

by reason of disease it would not only be more humanitarian but it would be an immense saving financially.

Another consideration in this connection having a direct bearing on race betterment relates to the handicap to the boy or girl who is allowed to grow up with deformities of the mouth and face due to irregular teeth. In this age of keen competition for place and preferment the appearance of the individual so far as physiognomy is concerned has much to do with his prospects for advancement. One striking case came under the writer's observation, and it seems worth relating as illustrative of the point under consideration. In one of the eastern schools for girls there is a most estimable woman endowed by nature with the mentality and executive ability to be principal of the school, and to wield a large influence in the educational world. Only one thing prevented her advancement and kept her in a subordinate position. When she was a growing girl some one who had charge of her—let us hope it was not her parents—permitted her to come to womanhood with such an irregularity of her teeth that it was impossible for her to cover her upper anterior teeth with her lip on account of the undue protrusion of the upper incisors. This caused such a deformity of her jaws and face that it detracted immeasurably from the force of character of her countenance, and as one young lady pupil expressed it without quite knowing the reason:—"Somehow you could never imagine her as a principal of a school."

These things give us pause and make us wonder if we have any right to bring children into the world and allow them to grow up with such physical handicaps as shall prevent them from having a fair chance to make their way advantageously in life.

It is to the prevention of disease, the relief of suffering, and the correction of deformities—thus adding to the efficiency and happiness of the individual and the community—that the dentist is committed in his function for the betterment of the race.

THE INTERRELATIONSHIP OF ALVEOLAR OSTEOMYELITIS WITH SYSTEMIC DISORDERS AND A FEW WORDS REGARDING TREATMENT WITH AUTOGENOUS VACCINES.*

BY H. H. SCHUHMANN, M. D., D. D. S., CHICAGO, ILL.

So much has been written on this and allied subjects of late that I must ask you to forbear with me if I am at times compelled to allude to matters with which you may be thoroughly conversant, and again only touch upon other subjects that may seem of vital importance. The time allowed is so short that it is almost impossible to cover the ground thoroughly, but I hope that a lively discussion will bring out some of the salient points more minutely.

The conclusion, that the human mouth, as an incubator of pathogenic germs, performs a significant part in the production of various bodily disorders, has in the past few years become stronger and stronger in the minds of physicians and dentists as well.

That the constant presence of deleterious microbes, particularly those of the pus-producing varieties, in the oral cavity, must of necessity have detrimental effects on such eliminative organs as the kidneys, liver, intestinal tract and on the circulatory apparatus, I hardly think anyone at this time will dispute. Only recently Drs. Rosenow and Billings conclusively demonstrated the serious results of mouth infections on the valves of the heart, and other earnest workers, such as Medalia, Professor of Bacteriology at Tufts Medical College, of Boston, Edward Baker, of this city, and many others, have shown the concomitant diseases so frequently found closely linked to oral infections. Professor Medalia, in particular has shown the tremendous improvement in conditions such as rheumatism, boils, furuncles, interstitial nephritis and acne by the use of autogenous vaccines for the treatment of alveolar osteomelitis occurring in conjunction with these diseases. I have had quite a number of most interesting experiences myself along these lines, which bear out the theories and results Medalia mentions—that is, that autogenous vaccines made from smears from

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the mouth have shown marked results, not only on the oral conditions, but on the various constitutional disturbances as well, showing thereby the interrelationship rather conclusively.

While the results obtained from the use of autogenous vaccines have in a measure proven the corelationship of various systemic disorders with alveolar osteomyelitis, or with other oral infectious troubles (by the manner in which the *two* are cleared up simultaneously through the use of *one* vaccine) still we would hardly be justified at this time in accepting "*prima facie*" the positive statement, as it is made by various observers, that such corelationship of the systemic disorder had been *conclusively* proven by the action of the vaccines, and, still less so, that the oral sepsis was the *primary cause*. While *definite proof* for the etiology of such systemic diseased conditions may be lacking, or at least not be conclusive, it does at this time seem rational for us to accept these theories of the cause being oral infection as practically correct.

Many physicians besides Hunter, Goadby, Rosenow and Billings, (the latter two you will recollect we had in our midst only a short time ago) have proclaimed this relationship and etiology more or less definitely. We all must admit from our own experiences that the possibility, and even the fact, that infections of the antrum of Highmore are quite frequently caused by the diseased roots of teeth. That the absorption of pus germs through the lymphatic system from the mouth and throat is productive of adenitis and lymphatic tumors is also a well-established fact. Acute and chronic polyarthritis is an affection well within the possibilities of having its primary cause in oral infection, and this is definitely claimed to be the case by Judson Donald and Medalia. Alveolar osteomyelitis, pyemia and septicemia is another combination which has been dwelt upon in our literature to a considerable extent, and the cause of these systemic disturbances laid at the door of this disease.

The simultaneous cure of alveolar osteomyelitis with scattered boils or furuncles by *one* autogenous vaccine, made from the oral secretions, also tends to prove the close relationship, if not the primary cause, of *these* conditions. Medalia claims absolutely the cause in several of these cases to have been oral infection. The whole medical profession is beginning to appreciate the seriousness and usefulness of our training and our efforts in research work

along these lines. Dr. M. L. Rhein, of New York, in a most praiseworthy contribution on this topic has brought to us and the world a fuller and better understanding of the sphere of our work, or what it ought to be.

To be able to grasp the situation more clearly, before referring to the possible line of treatment for these cases, let me for a moment consider the anatomical relationship of the area involved and the etiology of the trouble as well.

In its inception this disease in the majority of cases is started by traumatism, or there may possibly be other causes which have as yet not been conclusively demonstrated; at any rate, the usual first manifestations are mild inflammatory symptoms, possibly reaching the pus stage, which are later perpetuated by the deleterious influence of pusproducing micro-organisms. It has been recently learned that it is the presence of the foreign or heterologous protein of the protoplasm, which composes the bodies of these bacteria, that causes the injury to the body cells. Miller, Galippe, Hunter and others have shown these germs to be constantly present in these affections, the pneumococcus in chain form, the staphylococcus aureus and albus are practically always present, and very frequently the micrococcus catarrhalis and various forms of staphylococci. The proportion in which these different organisms occur is very uncertain.

Naturally, the question of immunity plays a big role in the development of these chronic infectious diseases. Immunity being: The capability of the tissues to so react on micro-organisms present as to prevent them from proliferating in quantities and with such virulence as to become disease producers. In our circulatory fluids immunity is represented by the presence of antibodies, such as bacteriolysins, hemolysins, agglutinins and precipitins, as well as by the action of the phagocytes. The defensive agents which at this time interest us more prominently are the antibodies against the pusproducing germs—the degree of immunity which we possess is at all times of a relative and selective kind. At times it develops strongly against a certain group of organisms, and at other times against an entirely different type; in other words, it is *selective*.

If at the time of primary infection the degree of immunity or the opsonic index, if you please, should be low against the

pneumococcus or streptococcus, above referred to, a full-fledged case of alveolar osteomyelitis might be expected to follow. The battlefield for these germs is the medullary space in the maxillary bones holding the teeth (commonly known as tooth socket), and the ligamentous attachment of the tooth.

I am omitting to mention that phase of variance in susceptibility to disease due to altered *reaction* of the oral fluids and of the blood, in order not to try to cover too much ground in too superficial a manner, but even if time does not permit me to go into the matter at great length, we can not allow it to escape our attention entirely. That certain varieties of germs thrive lustily in an acid medium and do not in an alkaline medium, and vice versa, is well known, and that the surrounding secretions as well as the blood are changed at times in reaction by that malnutritional disorder called acidosis or acidemia is also well known. The study of the effect of this reactional phase will lead us deeply into the study of the enzymotic action of the phagocytes relative to leucoprotease versus the lmyphoproteases.

In fact, so many other matters enter into the field of research, if we care to take up the study of these conditions (in a really scientific manner), that it is almost bewildering.

Having made some reference to the defensive measures of nature, we are now enabled to form some idea as to the proper course of procedure regarding curative measures. Empirical methods of treating diseases and purely mechanical ones as well, should be superseded by scientific efforts, and after the etiology of diseased conditions is established in the mind, a proper course of reasoning should put us on the right track to correct treatment. In doing so the fact that I omit reference to local treatment should not indicate my lack of appreciation of the fact that that part of the treatment is any the less important but I do not feel that the procedures in that direction have any place in this paper. It goes without saying that all local deposits are to be removed.

I shall avoid going into the detail as to curative measures at this time, still it will be necessary for me to briefly allude to them in order to show the interrelationship of the local and constitutional disturbances. To do so, let me for a moment repeat what I alluded to before, with reference to immunity or resistive power. It is no

longer necessary to take the opsonic index to find the *degree* of immunity in each individual case, firstly, because of the great difficulty of doing it precisely; secondly, because almost precise results in human animals are unobtainable, and, thirdly, because the results of the actions of vaccines on the opsonic index are rather definitely established through the excellent work done by Medalia, of Boston, who went to very great trouble to obtain these findings, and after having made use of the results of his work in that direction, employing his methods of treatment, I feel sure they can be relied on thoroughly.

Of course, you understand that the introduction of autogenous vaccine produces what is termed *active* immunity, in contradistinction to *passive* immunity. Active immunity (in vaccine treatment) being that variety of immunity created by the patient producing *his own antibodies* by virtue of the stimulation he received through the irritation occasioned by the introduction of the dead bacteria in the vaccine, *they* acting as the necessary "irritant." In *active* immunization the index of immunity at the very beginning of the reaction drops below the axis of *abscissus* (or normal point) into the negative phase, and then gradually (for a period of about six days) rises, into the positive phase, then falls again; while in *passive* immunization the reverse is the case, the degree of immunity being raised. The rational method of dosage and repetition of dosage is readily seen from the foregoing results. The dose must be repeated and increased during the time the reaction is in the *passive* phase, and, if possible, a day or two before the dropping toward the negative phase sets in, so that the degree of immunity is gradually raised successively to a higher and higher plane. A graphic illustration of the line of opsonic index being similar to a step form (illustrate). Formerly, it was necessary to obtain the opsonic index a number of times in each case before we could know just when the dose was to be repeated, but as I stated before Medalia has shown that the proper time for repetition is between the fourth and sixth days. (At times this may have to be modified owing to the local reaction.) There should be but a slight local reaction from the very first dose, a mere reddening and slight inflammatory area covering a surface about the size of a half dollar piece. The next dose, regardless of time, should not be given until that reaction has

practically disappeared, and if it was severe in the last instance, the quantity should not be increased, but preferably slightly decreased. By this method the degree of immunity to the particular organisms used will be slowly raised until such a stage is reached that germs can no longer reproduce themselves and the suppuration will cease, or in those cases where there was no pus, but simply a low inflammatory stage, that condition clears up. The vaccine is then discontinued.

You will realize that by this process the germs are not merely washed away for the time-being, or the tissues temporarily stimulated, but the fluids and receptors of the cell bodies are actually so changed that they become impossible surroundings for the germs to thrive in.

The whole vaccine theory and the theory of immunity are built on rational lines. The immunity to a species of bacteria is raised by the production of sufficient antibodies to prohibit its growth or further development, and that action is brought about by the stimulation or irritation the animal (or person) receives from the introduction of certain forms of irritation, namely, that of the germs in question. The bacteria which are already present have not sufficient irritative powers to product this result, because the system has gradually become used to their particular degree of virulency. For the same reason the autogenous vaccine can be improved by the addition to it of some "stock vaccine" containing the same germs, only in a more virulent form. I prefer the use of autogenous vaccines slightly mixed with stock vaccines to stock vaccines alone, because of the well-known fact that the effect of the growth of one class of germs on another different species has considerable influence, and by using autogenous vaccines we are employing that particular proportion of mixture of germs with their respective degrees of virulency which are already present in the system, and we are in no way interfering with the relationship of the different classes of bacteria to each other. Without keeping this point in mind our treatments might result in the death of one class of bacteria and allow the other to gain the upper hand. This might possibly produce an entirely new and different symptomatology. The making of autogenous vaccines is not a simple matter, and in their production the influence of one class of bacteria

on another class must be considered. A culture medium must be selected which is equally acceptable to all varieties of germs to be propagated. It has been demonstrated that the degree of immunity depends to a large extent upon the degree of irritation, that is, upon the virulency of the germs causing the trouble. A mild coryza, for instance, produces an immunity to a repeated attack in a rather negligible manner; an attack of diphtheria means practical immunity for many years; an attack of smallpox, an immunity lasting a lifetime.

I am spending more time than I intended to over these matters, and I hope I am not boring you, but once started along these lines it becomes difficult for me to know when to stop.

I don't want to create the impression that I am over-enthusiastic over the vaccine therapy, but I have seen some remarkable results, and the science seems rational and well worthy of close investigation. If ordinary care is used, there are absolutely no dangers to be apprehended by this method of treatment. The great bugbear of serum treatment, namely, "anaphylaxis," does not enter here at all, for the simple reason that anaphylaxis or serum disease depends on the presence of a serum. None being used in vaccine therapy, there cannot be any question of anaphylaxis, at least not in the sense the expression usually conveys. The quick results from these injections are astounding, pus disappearing very quickly and any symptoms depending on general infections from the pathogenic germs present in the mouth also vanishing very quickly. If the infection has been lasting for a sufficiently long time to cause organic changes or pathologic conditions of other organs, those diseases will be cured, at least to the extent of having the primary cause removed.—Cases of arthritis, neuritis, intestinal disorders, tonsillitis, colds, furuncles, acne, etc., are frequently entirely cleared up as if by my magic. Naturally this refers to cases where the trouble arose from the mouth infection, and there must be a great many such, as I have seen these results in many, many cases, not all of my own, but cases of other investigators. Of course, all cases of metastatic infection are not due to trouble arising from mouth diseases, but many of them are.

In eighty per cent of the cases of alveolar osteomyelitis treated by myself in the last eight months I have found the blood pressure,

the blood and urine examinations (both chemical and microscopical) either all, or one, or the other, to vary from the normal, and in such instances patients were immediately referred to their respective physicians for cooperation and treatment. All of these applicants imagined that they were in the best of health, and as a matter of fact few of them were really sick. Some vital organs were simply not doing their proper amount of work, not to a sufficiently poor degree to cause the patients any disturbing symptoms, however, leading up to serious future complications. Had they really been ill or suffering, they naturally would have consulted their physicians and the trouble would have been discovered without my alluding to a *deficiency* in the function of any of the organs. These examinations must be made most thoroughly and in a painstaking manner. We are not looking for a well-developed case of leukemia or a Bright's disease, but are examining a patient who is not yet exhibiting pronounce symptoms, but usually only exhibits a deficiency in the workings of some of his organs, and such a condition naturally is much more difficult to find than a well-developed changed state of the blood or urine. Thought and great care should guard you in these examinations from arriving at any diagnosis or from making wrong statements as a result of insufficient deliberations; and considerable knowledge on these matters must be at your command before any expressions as to disturbed conditions should be made. The mere change from the amount usually considered normal, say, for instance, of chlorides, or of urea or ammonia in the urine, does by no means *always* mean an unbalanced condition of the secreting organs. The variance should at once be compared to the correct urinary coefficients—in other words, the relationship of the excreted amounts of these chemicals to each other. Then, if you find a variance from the usual, and only then, are you sure that a statement of abnormal action of the process is warranted.—I have found physicians to be heartily in favor of scientific investigations on our part along these lines and their cooperation is gladly accorded.

That the presence of micro-organisms in a virulent state, such as we frequently find in a "hotbed" like the human mouth should cause systemic disturbances and infections is to be expected; the germs acting in the same manner as any poison capable of pro-

ducing constitutional invasions by many various means, as H. P. Pickerill states in his work on "Stomatology," either by local extension, absorption of toxins through the lymphatic system; metastatic infections lower down on the mucous tract, or by absorption into the bloodstream. The great variance of local and general immunity is here again to be emphasized.

A number of men in this city, I am happy to say, have gone into the scientific study of these conditions, and I am certain their efforts will be productive of good results. Already a number of peculiar changes frequently present in the blood analysis of patients suffering from alveolar osteomyelitis have been noted. They may or may not be of serious consequence; so far the examinations have not been made in sufficient numbers, nor are we at present satisfactorily familiar with the normal blood pictures to make any definite statements regarding these matters, but it has proven one thing, and that is that scientific research and investigation, properly tabulated and recorded, promise to tell us many things which will be of great assistance in clearing up some of the matters we are at present working on in a more or less desultory and empirical way. I am glad that the profession generally has awakened from its long slumber in working along mechanical lines almost exclusively, and I am happy to note the sudden and emphatic manifestation of appetite for scientific facts and results which is springing up in all quarters over this broad land in the ranks of our profession. I hope that the study and thereby the foundation for a real scientific research work will be raised higher and higher, so that we all may be proud to be members of a thoroughly scientific and progressive profession.

PROCEEDINGS OF SOCIETIES.

ODONTOLOGICAL SOCIETY OF CHICAGO.

A Regular Meeting was Held January 6, 1914, with the President, Dr. L. L. Davis, in the Chair.

Dr. H. H. Schuhmann read a paper (by invitation) entitled "The Interrelationship of Alveolar Osteomyelitis with Systemic

Disorders and a Few Words Regarding Treatment with Auto-genous Vaccines."

DISCUSSION.

DR. C. N. JOHNSON:

The early part of the paper dealt with the systemic effect of oral sepsis, and that, as the essayist has said, is a very prominent question before the medical and dental professions at present, and it is not too early that attention should be called to that matter. I feel, however, probably that there is danger, unless a very careful consultation be had between the professions, of the medical profession in some quarters overstating the danger of systemic affections from oral causes relating particularly to crown and bridge work. Some of our medical men are going so far as to condemn absolutely crowns and bridges in the mouths of our patients on the basis that they are a menace to the health of the individual. It is true much of the crown and bridge work that has been done is open to very serious criticism, but I think it is also true that there is some crown and bridge work being done to-day that is as sanitary as any other work we perform in the mouth, and in the aggregate I believe crown and bridge work is a great benefaction to the people. If the medical men who are condemning it in a wholesale way could be enlightened as to the possibilities of hygienic crown and bridge work, so that they would not be so extreme in some of the statements they make, it would be better for the people.

In regard to the use of vaccines, it is a subject I know very little about and yet, it seems to me, in view of the wonderful effects that have been produced by some of the vaccines, such as the vaccines for small-pox, and so on, in the suppression of these terrible epidemics, it is only reasonable to suppose that when we do get correct vaccines we can eliminate much of the suffering and many of the diseases that are manifestly due to bacteria. I feel that in our present stage, however, we have not gone very far into the scientific investigation of this question of vaccines. Some men are enthusiastic about them, but in a practical way I have not been able to learn yet of any very marked results—I mean reliable results—in the treatment of such diseases as pyorrhea alveolaris. I feel that that time may come, but so far as the

practical application of the vaccines to this disease is concerned, I do not believe that it has been demonstrated so far that they have been very beneficial.

A certain physician in the East a year or so ago published some statements in regard to this matter—in fact, I had some correspondence with him in regard to these vaccines and tried to get him to write an article on the subject, and yet when it came to writing an article, he stated that he did not feel at present justified in committing himself.

I have information from another city (and I do not care to mention the source) in which vaccines for the treatment of pyorrhea have been used more probably than in any other city in America, and the reports are not favorable at all. The patients have been made ill by the use of the vaccine treatment, and there has been very little good resulting from their use, and the situation in that city is discouraging so far as the vaccine treatment of pyorrhea alveolaris is concerned. That may be wholly due to the fact that the men have been using it without judgment; they have not understood, as I believe very few do understand, the *modus operandi* of the vaccine treatment. In any event, I feel, Mr. President, we are indebted to Dr. Schuhmann for bringing this matter to our attention. I feel it is something we must investigate, and I hope in the future some good will come from it which will result in benefit to our patients. But I also feel that we must study the question from a laboratory and clinical point of view much further before we are justified in using these vaccines upon our patients as they come to us day after day. I believe it is acknowledged that these vaccines may do a great deal of injury unless we know how to use them intelligently, and what I fear is, unless this matter is handled with a great deal of conservatism, the profession will rush in and use these vaccines indiscriminately and empirically, and probably do more harm than good with them, and bring a system which has possibility of some good, into disrepute. I simply throw that out as a word of caution, so that we may undertake the work of these vaccines intelligently. Personally I welcome any light that can be thrown upon the subject with the hope that we may be able to use these vaccines intelligently and do good to the people.

DR. ELLIOTT R. CARPENTER:

I have listened with a great deal of pleasure to Dr. Schuhmann's paper, but do not consider myself in any way capable of discussing it directly. However, I take this opportunity of thanking Dr. Schuhmann for bringing this subject before us.

I am on record before this society—and I have had no reason so far to change my mind regarding a statement that I made—to the effect that at least fully fifty per cent of the cases of pyorrhea are due to malocclusion. I still think that; that pyorrhea may be manifested in other parts of the body through the conveyance thereof there is no doubt. The presence of a pus organism in the oral cavity has been established beyond a doubt.

I think this is a timely subject, and it is going to stir us to a right dutiable investigation.

About a year ago I had the case of the wife of a prominent physician, a man who is an able diagnostician, and I happened to be ill at home at the time for several weeks, so that I was unable to offer aid the time when this patient was in trouble. Briefly, she developed an abscess in the lower first molar and second bicuspid, with the resulting inflammation in the tissue adjoining both of these teeth. She suffered from swelling in the knees. Her husband possibly thought the infection came from that source. I was just barely able to drag myself out of bed to go to the telephone to consult with this physician two or three times until my own physician forbade me to leave my bed. I gave my consent to have the two teeth taken out. This was done, and within a short time thereafter, the swelling in the knees ceased, and the patient got well. So much for the inter-relationship.

I do not believe that pyorrhea is a systemic disorder. Systemic disorders may ultimately come from pyorrhea. If it were so, we would have a specific germ of which we have none.

We are very much indebted to Dr. Schuhmann for bringing this subject before us, because it will stimulate us to study the subject systematically.

DR. TRUMAN W. BROPHY:

The presentation of this paper leads us to believe that we are endeavoring to accomplish our work in a scientific manner rather than by surgical procedure or by mechanical means only.

In writing upon this subject, I have discovered eighteen names under which it is known, including alveolar osteomyelitis. In any event, we all know what is meant. We mean a dento-alveolitis. That is what it is, whether dento-alveolitis terminates in suppuration or not. If we have suppuration following a dento-alveolitis we have a flow of pus-pyorrhea. That is why it was first described in America by Rehwinkle as pyorrhea alveolaris. The name is not a new one. It was used prior to his time by an English gentleman whose name I have now forgotten. Dento-alveolitis or alveolar osteomyelitis, or what ever you wish to call it, is a disease that is introduced in my opinion by an irritant. Like almost all inflammations, there is a cause, and that cause is a local irritant in most cases. I have seen some cases in which no local irritant was traceable or discoverable, and yet I am satisfied there was a local irritant as in the case of neuritis. You do not see any cause, you do not see a local irritant, but the local irritant is there, and the means at our command fail to enable us to discover it. There is no use in trying to remove this disease by the use of vaccines, provided the cause of the disease still remains. There is an old axiom in surgery that has been handed down through the centuries, and it will last to the end of time, that when a part is in an abnormal state, remove the cause and put it at rest. The cause of inflammation of the alveoli must be removed. The parts must be put to rest. If malocclusion exists, that malocclusion must be corrected. If irritants are about the teeth in the form of calculus, either serumal or salivary, these deposits must be removed, and then if infection continues, I have no doubt that autogenous vaccines will be a good thing. No doubt it will be just as beneficial toward establishing the powers of resistance in the case of infection about the dento-alveoli as it will in establishing a zone or barrier of protection about an inflammation of the kidney.

I presume Dr. Schuhmann intended to have us understand that he would not depend upon vaccines except in cases where all the disturbing elements were removed, although he did not say so in his paper.

I think in reading this paper which Dr. Schuhmann has so carefully prepared, he will be misinterpreted by those who will complain and criticise him because he did not state that every local dis-

turbing element should be removed prior to the use of vaccines. The trend is likely to be this: The man who reads this paper and who tries to follow its teachings will not carefully make use of his instruments. He will make use of vaccine therapy, hoping he may accomplish everything. That would be my criticism of Dr. Schuhmann's paper. I say this with all kindness. There are many dentists who will drop into that fault and they may think they can cure the trouble by the use of vaccines and by them alone. We cannot be too broad along this line.

We all appreciate Dr. Schuhmann's coming here and reading this paper to us. The use of vaccines opens up a field that has been only for a little while considered and discussed. I do not think vaccines have ever been put sufficiently to the test—at least for a sufficient length of time to impress us with their value.

Dr. Johnson tells us that in one city, where more of these vaccines have been used than anywhere else, they are skeptical as to their efficiency. A great problem will have to be solved. The truth will be revealed. The merit of vaccines will be determined and when that has been done, when we find their real merit, it must be based on absolute cleanliness of the parts first. I could relate to you some experiences I have had in the last six or eight hours of conditions that have been due to the want of adoption and the carrying out of hygienic measures. For instance, my assistant in surgical work, who is here, has seen this afternoon five or six patients suffering from maladies, some of them malignant, all due to the want of hygiene. I know it is digressing from the subject, but the whole essence of the paper is upon the subject of cleanliness. One of these patients came in with a carcinoma of the face due to sharp teeth, to teeth so sharp that they would cut the finger when it was drawn over the enamel. This patient has enlarged lymphatic glands, enlarged submaxillary glands, and the tumor has grown to an enormous size.

Another case is that of a little girl with a growth on the bone which looks like a general exostosis. She has an absolute deformity of the face, due I believe to the inflammation following death of the pulp in a first permanent molar, and another with a sinus beneath the chin due to infection of the teeth. There are many other cases of that sort, all due to the lack of adoption of

hygienic measures. They are typical cases of dento-alveolitis of different form. Any inflammation that can come to these parts comes under that name. Alveolar osteomyelitis implies what the patient has—a disease. Pyorrhea is not a disease but a symptom.

I hope to get closer to the subject of vaccine therapy and know a great deal more about it. We have seen remarkable results from it. We do not know a thing about it—in fact, except by clinical experience. What did Jenner know about vaccination? He did not know a thing except empirically. The milkmaid's cracked fingers got the virus of the cow and she did not have small-pox. Jenner concluded that it would be a good thing to inoculate them all that way. One hundred years or more passed before it was finally found out small-pox was due to this bacterium. He did not know anything about bacteria in his day, and many other things are coming out in that way, as, for instance, antitoxin for diphtheria. Inoculation of the germ modifies the action of disease and prevents its virulency. So it is with this disease. Any pus cells found in the body may be taken up and vaccines made and inoculated and modify the action and terminate the suppuration in many instances.

DR. J. G. REID:

I presume no one is more interested in acquiring information upon new subjects than myself. I usually delight myself in reading literature and in picking up anything that seems to be new. This is new in a manner, and yet it is not new, but it has been before us a sufficient length of time to arouse our attention to what has been going on with men who are willing to sacrifice their time and devote their attention to the uses of vaccine therapy.

A thing that usually grates upon me more than almost anything that I know of is our inadequate knowledge of the nomenclature of our profession. It seems to me that for the past thirty-five years we have been far apart in the establishment of a nomenclature which would fully describe what we mean. I have heard the last speaker relate many times in his debates the various names by which this disease is called, and we are familiar with almost all of them, and if they happen to be published we know what they mean. Perhaps the word that he used tonight describes more definitely than almost anything else the actual condition which is under discussion at this time—dento-alveolitis. I want you to understand

that this is not far from the words here used I mean, alveolar osteomyelitis.

The last speaker touched upon one particular part of the paper only which appealed to me more than any other namely, that when you remove the cause of the disease a cure will usually be established, and I believe, and have not been convinced to the contrary, that this disease is one of a local nature, purely and simply. It may be aggravated by other diseases, constitutional deficiencies, etc. It may be aggravated by those, but it is purely in my opinion a local manifestation and it is an irritant without any question that starts it.

As to the application of vaccine therapy in this disease, there is one manifestation of this disease that appeals to me as being a condition where the application of vaccine therapy would be exceedingly beneficial, and you are all familiar with it, although it has not been touched upon, and I presume, as the writer stated, he did not care to go into minute details, but undoubtedly he had it in mind at the time. We have a manifestation of this disease wherein apparently no local conditions can be the cause of the disease. We have no deposits; the roots of the teeth are free from any foreign elements of any kind, and yet the disease manifestly progresses. There is pus flowing from the sockets and the roots of the teeth are smooth and apparently in perfect health. You are familiar with such cases, and it seems to me that is one particular wherein vaccine therapy might be the very thing for an ultimate recovery. Outside of that it is a local manifestation and it is necessary to remove the cause of the irritants mechanically, and when this is done there is no necessity for the introduction of vaccine therapy. That seems to me logical reasoning as I now understand it, and the paper very meagerly alluded to that condition. That is the only condition wherein the application, as recommended by the writer, would be a most desirable adjunct to the cure of this disease.

DR. P. J. KESTER:

I know somewhat the feeling of Dr. Schuhmann when he approached this subject. I do not claim any right to speak on this subject, but I know somewhat of the breadth of the subject. As I stated in my paper at the very beginning, the study of immunity is the logical sequence of the study of bacteriology.

Dr. Brophy spoke as though Jenner discovered vaccination, a thing which he did not do, but he simply modified it. The Chinese vaccinated a thousand years ago. They vaccinated each other from the small-pox patient until the whole nation became almost immune, so that small-pox in China is considered no more serious than measles in this country.

In looking over the subject of immunity recently I was reading the history of the black plague in the fourteenth century. Reference was made to the extreme virulence of it, and the deduction was drawn that this extreme virulence was due to the fact that it was an entirely new infection. It spoke of the extreme virulence of measles (which we consider a very mild disease in this country) which was introduced among a people who never had had the disease, and it proved extremely fatal to them.

In the old school the definition of science was very simple, namely, classified knowledge. In this matter of serum therapy I do not believe we have any right as dentists to practice serum therapy until it can be demonstrated in the laboratory first that it is an established good. Of course, laboratory tests and clinical tests are entirely different, but until definite results from definite operations or actions can be proven, we are taking a great chance when we undertake to introduce serum therapy among dentists of the present day. There are very few dentists, and I know a great many of them, who have sufficient discrimination to take up this subject and undertake the practice of serum therapy at this time. So I believe the great good that a paper of this kind will do is to stimulate thought along this line of inquiry. I believe it is a subject that will bear study. Of course, I am more interested in the subject I undertook to introduce myself, and that is the natural immunity of the body itself.

I believe, and I think Dr. Schuhmann will bear me out, that the whole literature of immunity, the whole science of immunity is based upon the power of the living elements of the body to protect themselves against the invasion of deleterious micro-organisms. Their effects are modified by the condition of the patient as to health, food, environment, etc. All of these things have much to do with this power of the body to resist the invasion of poisonous micro-organisms.

Dr. Schuhmann has done us a favor by coming here and presenting this paper.

I agree with Dr. Brophy, but I do not agree with Dr. Carpenter, in regard to pyorrhea alveolaris. I believe it is produced by a definite organism, and that this organism may produce under other conditions, other disturbances. I do not believe that it is one kind of bacteria which produces it at one time, and another at another. Granting that pyorrhea is produced by a specific germ, I agree with Dr. Brophy that if it were possible to put the mouth in an absolutely normal state or in a healthy condition, we could overcome pyorrhea alveolaris.

DR. J. E. HINKINS:

This is a very important subject, and I am sorry that so few of the dental profession know anything about it. The time is ripe for papers of this kind to be read before our dental societies, and the profession calls for them. As I caught the trend of Dr. Schuhmann's paper, these vaccines are to be used after the mouth has been thoroughly instrumentized. This treatment is not for the grand stand orator or the hot air man. It is a method of treatment that has a place for good honest scientific work. The man who has not got some gray matter is not competent to do this kind of work.

I am not going to try to go into the etiology of alveolar osteomyelitis or pyorrhea alveolaris, but I am going to try to confine my remarks to one particular phase of the subject. I have known of the work of the essayist, what he has been doing, and what others have been doing along this line, and the men to do this kind of work intelligently and for the betterment of suffering humanity have got to know something more than we got in the dental schools a few years ago and even what we are getting in the dental schools today. If we are going to practice dentistry scientifically as honorable men, we must know more about physiological and pathological conditions. When a man comes to make or give a treatment with vaccine or serum he should be qualified for what; to make a physical examination of his patient, not by hearsay, but by actual demonstration, and I know the essayist can do that. He is capable of doing it. He has done it many times. A man should be able to make a blood smear, make a differential count, take the temperature of the patient, be familiar with systolic and diastolic pressure, he should

know the percentage of red blood corpuscles and the percentage of white blood corpuscles; he should be familiar with the functions of the leucocytes, the lymphocytes, and the phagocytes, and should know about the polymorphonuclears, what their percentage is, and should keep a record of them, and only when these things are done will one get results from this kind of work or method of treatment. The man who simply picks up a syringe and gives the patient an injection of these vaccines is not the man to do this work. We want scientific work, scientific data, and results. I believe the time is coming when this will be a part of the treatment of the progressive dentist. The dentist of the future has got to be a scientific man. I expect to live long enough to see the day when a patient comes for the treatment of pyorrhea alveolaris, the dentist will be competent to make the examination I have described and carry out his instruction in physical diagnosis and in prognosis equal to that of any physician. He has got to do that if he would keep abreast of the times.

I do not think the essayist did himself justice in presenting this paper. He is doing good work, and I hope he will continue.

DR. J. H. WOOLLEY:

I appreciate the paper of Dr. Schuhmann very much, and it in itself conveys a lesson that makes me feel that as far as many of us are concerned, we ought to be very careful in writing a paper to have a good deal more back of us than the paper itself shows.

I believe we will get more and more beneficial results from the use of vaccines in the treatment of the disease under consideration. When we come to the treatment of systemic troubles we know we have certain medicines that can be used; that there are certain cells in the system that have an affinity for certain kinds of drugs, so that when our knowledge becomes greater and our clinical experience more extensive, vaccine therapy can doubtless be used for special disease conditions, but I do believe, as Dr. Brophy and some of the others have said, that we want to get at the cause, because if we do not remove the original cause we may not obtain the results which we wish to get.

DR. L. L. DAVIS:

If any of you have taken the trouble to look over the magazines of the last two years, 1912 and 1913, you must have observed that

nearly every monthly publication has had something to say about pyorrhea, and it is only within the last year that there has been anything said about the subject of alveolar osteomyelitis or dento-alveolitis. In the last year and a half there has not been a thing said that has not been said twenty-five years ago. We are just beginning to do something along these lines.

I want to say one thing in regard to the essayist and his work. Of all men who are doing work along these lines in the city of Chicago, I think Dr. Schuhmann is doing more thorough and original investigation by scientific methods which he uses in his practice than any other practitioner. I cannot speak of the men who live outside of Chicago because I do not know of their work. However, I do know of the work the essayist has done and is doing, and there is not a man who is more capable of telling us something about pyorrhea than he is.

Each man has his peculiar belief in regard to this disease. Some men say they can cure pyorrhea alveolaris, but it is a question in the minds of those men who say they cannot cure pyorrhea. A good deal depends upon what is meant by the word cure. Some practitioners say they can cure the condition, while others say they cannot. Both are honest in their convictions. But if a person who has diphtheria should go to a physician and the physician should attend the case to its completion, and a recovery follows, naturally he would call it a cure. There is practically no possibility of return of the disease in that patient because he is immunized against the disease; but in pyorrhea we relieve the case by mechanical means, by stimulating the parts to return to as nearly a normal condition as possible, by the proper occlusion of the teeth, etc. I think, as Dr. Carpenter has pointed out, that malocclusion is the cause of a great number of cases of this kind, and so if we are correct about these things we do not bring about an absolute cure, particularly where the condition returns. What the essayist is after is to get the patient in a condition that almost any one of us at the time can improve the condition of the patient. In other words, he hopes by the use of vaccines to bring about absolute immunity in the case of that patient to the trouble, and I think there is a field for us here to do a little work. All honor to the men who are doing the greatest amount of this work at the present time.

Tonight a branch of the Chicago Medical Society is listening to two papers along these lines, showing that physicians are awake to the possibilities of this condition within the mouth. There is a paper to be read by Dr. Potts, who is a dentist as well as an M. D., on "Systemic Conditions Resulting from Oral Sepsis." There is another paper by another M. D. on "Bacterial Leucocytosis." It shows that the dental profession is awake and beginning to push the medical profession to do something and to recognize conditions along these lines.

Personally, I am under great obligations to the author of this paper for being present and reading this valuable contribution to us. It is a masterly effort, and he has put the treatment of pyorrhea alveolaris or alveolar osteomyelitis before us in such a clear light that he who runs may read.

DR. F. E. ROACH:

I am very much interested in this subject. We all know very well the futility of our efforts to treat pyorrhea by mechanical means and thereby obtain permanent results. We know the tendency to recurrence of the disease once it has attacked a patient. While Dr. Schuhmann did not bring that out in his paper, I was in hopes he might do so, but Dr. Davis has brought out the point of the use of the vaccine treatment as an after treatment to put the patient in that state of immunity to prevent the recurrence of the disease. I believe that pyorrhea in the majority of instances is amenable to local treatment, but we have to continue that local treatment by the removal of the cause or the deposit which is the local irritant, and if that is the intention and purpose of vaccine therapy, I believe great results will come from its application. I am very much interested in Dr. Schuhmann's work in this direction. I have not given the subject any serious thought or study, but I am nevertheless interested in it, and it is for such men as Dr. Schuhmann, who have this inclination and the ability to work along these lines, that I am looking to for a perfect application of this vaccine therapy.

I want to join with the other gentlemen in my expression of appreciation of this masterly presentation of the subject. I think the way Dr. Schuhmann has presented it, with the exception of the necessary caution in the use of this treatment, is to be highly com-

mended. I am sure he did not intend to leave out the necessity for the surgical removal of the primary cause of the disease. Unless this caution is put in the paper, I fear the paper will be misinterpreted by a great many members of the profession, and a method of treatment that has splendid possibilities may result in great damage.

DR. SCHUHMANN (closing):

I want to thank the gentlemen for the interest and kind words they have said about my paper.

With your permission, I shall take up the various questions and points brought out in the discussion in the order in which they were made.

One of the speakers said that crown and bridge work is apt to be decried by the medical profession in too vehement a manner on account of its producing pyorrhea and constitutional defects. Yes, it is quite likely that men who are not acquainted with the difference between good and bad work will classify all work under the head of bad; but I want to say *this* regarding bridge work and crowns, that I think there are many crowns put on and bridge work done which are mechanically good, and still there may be gingivitis and afterwards pyorrhea started up on teeth which have been properly treated mechanically as far as the bridge work and crowns are concerned. This again brings up the point I made in the paper, that the degree of immunity, both local and general, has a good deal to do with the possibilities of the occurrence of any diseased conditions in any locality or in general.

I saw a gentleman this afternoon who was sent to me by a physician. He was said to be suffering from stomach trouble, and he is in a very nervous state. He is almost a neurasthenic, and has been examined by a good physician in this city, and also by one in New York, both claiming that he had no particular pathologic disturbance in his stomach, and that his trouble is largely due to the infection that has taken place in his mouth. I am quite sure that man will be cured after proper local treatment in his mouth and by the use of autogenous vaccines.

The practical application of vaccine therapy for pyorrhea is a point Dr. Johnson has made and which is well taken. I am not one of those investigators who is willing to jump at conclusions

and I believe with Dr. Johnson that it is far from being proved that these vaccines bring about a cure in all instances and without the aid of other treatments they are not supposed to, they are not cure all. I do believe, however, that *with* the vaccine treatment in *addition* to mechanical treatment we can obtain good results in the treatment of pyorrhea, that it will ameliorate the flow of pus in the socket which is free from all mechanical irritation. The cases I have treated with vaccines, probably twenty-five of my own, (and those are the only kind from which I shall form my opinions) with those results in mind I would not want to make the statement that vaccines will *cure* pyorrhea, but I do believe and know that those cases of pyorrhea which have caused other systemic disturbances, when treated first mechanically, and then with vaccines will surely remove every constitutional influence that has been brought about by the infection in the mouth. If time permits, I will relate two or three cases that will show that conclusively.

I believe the main benefits from vaccine treatment will be found in the relief of the concomitant disturbances in the system, and not nearly so much so with regard to the local condition which is largely due to mechanical irritation, either from the presence of tartar or ill-fitting crowns, or malocclusion, or something like that, but the tissues will be immensely helped in their recuperative powers, the flow of pus diminished or stopped.

As to the bad results Dr. Johnson mentioned in one city resulting from the vaccine treatment, they must be ascribed to negligible treatment by the men who used it, or the faulty preparation of the vaccine.

I was East some time ago and saw a great many cases of pyorrhea which were treated with vaccine. I have treated twenty-five cases myself, and have probably made 150 injections of these vaccines in these cases, and I have never seen the slightest ill result from any of the vaccine that was used. The most I saw, (and I saw it in every case and effected it but only after the *first* injection) was a slight inflammatory area on the arm where the vaccine was injected, due absolutely to local poisoning. When this is absorbed and the following dose is given, the reaction should be less locally and grow less after each injection until the system has become immunized. It never produces any symptoms of any kind, local or general after that stage has been reached.

DR. CARPENTER: How about temperature?

DR. SCHUHMANN: The temperature does not rise at any time to any appreciable degree, perhaps 1 degree, after the first dose. You must be circumspect in using vaccines in such cases where there are concomitant diseases which include arteriosclerosis and heart trouble if the conditions are severe.

I noticed today one of the laboratories in the city has a type-written direction sheet for the administration of autogenous vaccines. Their vaccines are made so that each drop of the vaccine contains one hundred millions of bacteria. That is a vaccine which I would not use. It would be difficult to count 1,000,000 bacteria to each drop. It is quite possible the drop would contain from that solution, if not very thoroughly shaken before use, 150,000,000 or 200,000,000 bacteria, so when they are in such thick emulsion it is difficult to gauge the amount you are using. If you start inoculations with not over 10,000,000, that is, 2 drops of a solution of five million bacteria to minim of solution there will be no local reaction in the worst kind of cases. A slight red inflamed area about 3 inches square, if any. I prefer a minute initial dose like that even if it is so small as to be of little practical benefit.

DR. BROPHY: Do you always make a vaccine from each patient?

DR. SCHUHMANN: Yes. The vaccine is made in this way: You cleanse off the surface from which you expect to take a smear; say you take a smear from the buccal surface from the gingival margin of the upper first molar, wipe off the surface with a dry piece of cotton, hold the cheek away from the surface, so that you cannot have a new layer of bacteria, and take either a sterilized swab (a very small piece of cotton) on a sterilized piece of wood, or a platinum loop which has been sterilized in a flame, squeeze the gums a little above the teeth and put the cotton or the platinum loop under the gingiva as far as you can. For that reason it is better to use a platinum loop because you can push it up further. A slight amount of material adheres to the platinum, this is then rubbed over the surface of an agar-agar mixture, which is put in the incubator, and the germs are grown in the incubator. After twenty-four hours the entire surface of agar-agar is covered with the germs. They are then replanted, incubated and analyzed under the microscope to find what germs they are. Then separated and

standardized, and put up in solution, normal salt solution, with one-half of one per cent carbolic acid added to it. The latter keeps the solution sterile.

In making the injections the fleshy part of the arm is washed off with alcohol; a glass syringe with steel needle is boiled five or ten minutes and put together in a thoroughly sterile manner. You take the syringe out of the container in which you have boiled it with a pair of sterilized tweezers, pick up the piston, insert the piston with the tweezers, and not with the fingers. The heat is so great on the glass that the slight amount of water from it evaporates instantly. You put the plunger in, pick up the needle and screw it on with the pliers, so that the needle is absolutely sterile, and you can take the amount of vaccine you want in the syringe and measure off the drops to use, with a quick plunge you push the needle into the tissues. I have seen many physicians and nurses use hypodermic needles in such a way that it was cruel. One should never take a needle and push it into the tissues gradually nor when the tissues are flat. One should bunch up the tissues with one hand like this (indicating); take the syringe, see that the finger is *not on the piston* but only on the barrel of the syringe, and with one quick plunge you put the needle in right up to the hilt and squirt in the mixture, then withdraw the needle and wipe the puncture off with alcohol. Great care must be used in the preparation of the vaccine. If it is not properly made, harm is liable to result from its use. When you inject a mixture of autogenous vaccine you inject 10,000,000 germs; there may be 2,000,000 of the streptococcus, 5,000,000 of the pneumococcus, 1,000,000 of the micrococcus catarrhalis, and 2,000,000 of the staphylococcus. That would be a very mild dose, but you can only get the mixture correctly when grown in the proper medium under proper conditions.

I think the bad results obtained in the city where that vaccine was used, were due to faulty manipulation or to improper preparation of the vaccine.

DR. BROPHY: Were the bad results permanent?

DR. SCHUHMAN: I do not know. Dr. Johnson did not mention that but I would not expect so. In one case I recall a patient got a terrific local and general reaction. Muscular spasms and later a nasty rash all over his body which passed off in a very few

days. It was due to the fact that very much too large a dose was given by the physician who did the work.

DR. BROPHY: He is perfectly well now?

DR. SCHUHMANN: Yes.

DR. BROPHY: Have you heard of unexpected bad results?

DR. SCHUHMANN: This reminds me of a case I had about two weeks ago and shows that we must not believe all we hear and how carefully we should weigh our words. I had a patient to whom I gave the vaccine treatment 3 months past and considered it one of the most successful cases of vaccination I have ever had. This man came to me about a year ago last April with a very bad case of pyorrhea, and in addition to that he had an aggravated case of interstitial nephritis, with high blood pressure, and endocarditis. He was treated with autogenous vaccine. His pyorrhea was absolutely cured 3 months ago and is at the present time. His interstitial nephritis has very much improved. He has been living on a very strict and regulated diet which may have something to do with the improvement in his interstitial nephritis. The mitral regurgitation is gone, and his blood pressure is almost normal, 140 at present. Two weeks ago this man was taken ill with an erythema, which was nothing more than a skin rash, not at all serious, but the man looked bad. He had large lumps all over his head and body and someone said he was treated by me with vaccines. About three days later I heard from as many as twenty people that I had almost killed a man through the use of vaccines. As a matter of fact, I had not seen him for three months, but his physician was called to the house, and the gentleman told him he had pyorrhea; that he had had infection from it and had been treated by me with vaccines and was entirely relieved of his pyorrhea symptoms and some others as well. The doctor though, by the way, who is very much interested in the vaccine therapy, called me up and asked me if I had any more of the vaccine that I had used on this man, and I told him I had. He asked me if I did not think the injection of an autogenous vaccine would cure the erythema. The autogenous vaccine was used, and sure enough it did cure the erythema in 48 hours (*streptococcus vaccine*). Nevertheless gossip had distorted the story very badly, but in pursuit of scientific work we must ex-

pect that, you must be satisfied with a clear conscience that you are doing the right thing by your patients.

That the vaccine treatment will not cure pyorrhea *alone* goes without saying. You cannot cure any disease without removing the cause. I agree with Dr. Carpenter in that I do not believe pyorrhea is due to any systemic disturbance. I will qualify that statement by saying that I do think there are certain types of pyorrhea or gingivitis in the mouth which are caused, for instance, by diabetes where patients suffer from gingivitis and discharges around the necks of the teeth which may be caused by constitutional, and not by local disturbances.

I selected the name alveolar osteomyelitis in preference to others, because I think it describes the condition better than any I have heard until I heard the one given this evening by Dr. Brophy. I think the term used by Dr. Brophy is very much better, namely, dento-alveolitis. Osteomyelitis really means a disease of the bone marrow, and there is no bone marrow disease in pyorrhea. The alveolar socket is not a marrow socket at all. It is a medullary space.

DR. BROPHY:

The word alveolar alone does not imply where the inflammation is. It may be in the alveoli of the lung, or of bone or of the kidney, so dento-alveolitis.

DR. SCHUHMANN:

Dento-alveolitis is a good name. I took the name alveolar osteomyelitis because a good deal of the knowledge I have been able to get regarding the vaccine theory and things connected with it I have obtained from Dr. Medalia of Boston. He uses the term, and so I used it in my paper.

The removal of the cause of the pyorrhea probably would bring about a cure in all instances, if it could be removed entirely, but I have never seen a case yet where it has been removed by local manipulation.

I had occasion, this summer, when I went to Europe, to leave a patient in charge of a man whose manipulative dexterity cannot be questioned, and who is a specialist in pyorrhea. The patient, when I left, had an upper molar, which was still discharging pus. He was placed under the man's care on my recommendation while

gone and was treated by him for the purpose of having any deposits on the roots of the teeth removed. To my astonishment, when I returned from Europe, I found a thick green nasty pus coming from the palatal root of the molar just the same. There was no change. I tried for several weeks to remove the deposit. It was a deposit of serumal calculus, which was on the inner surface of the palatal root of the upper molar and entirely inaccessible. I destroyed the pulp of the tooth and amputated the root and the pus ceased. As I have said, the root was covered on the inner surface with a serumal deposit, while the outer surface was polished, as it should be. So it is sometimes impossible to remove these deposits. If these deposits are **not removed** I do not believe the use of vaccine will cure the pyorrhea although it does give the tissues involved a better chance.

From what I have seen of the vaccine treatment, I should say the main benefit to be derived from it is the relief of the concomitant symptoms such as there are of polyarthrititis or acne and others that go along with the pyorrhea.

The indiscriminate use of vaccines by men who are not competent to use them would naturally be followed by failure. I do not think any one who understands the value of vaccines and the seriousness of using them would employ them indiscriminately. Undoubtedly this treatment will be used indiscriminately by plenty of men who have not a fundamental knowledge of what goes with it, and in those cases there will be bad results.

I spoke to Dr. Johnson a little while ago about the bad results from the use of amalgam fillings when first their use became popular, and these were due to the fact that the amalgam was simply thrown into the cavities of teeth. There are undoubtedly lots of dentists who used amalgam in that way without excavating the teeth properly. They simply packed it down into the cavity and let it go at that. There are lots of men who will use these vaccines indiscriminately and get bad results in consequence thereof. I think dentists as a whole should become sufficiently familiar with these things if they believe in them and make the treatments themselves, and not turn over the work for someone else to do.

With reference to this allowing others to perform your vaccine treatment, let me relate about a patient I mentioned a little

while ago who received vaccine treatment. He does not live in Chicago, but lives in Michigan. I suggested the use of vaccines and gave full direction to the physician in his home town how to use them. The patient went back home and received vaccine injections, but while he was in the city last week and remained here for about ten days I had an opportunity to see him and to ask him some questions. I was a little bit afraid that the physician had not followed the directions I gave carefully and that he did not give the doses that I directed he should have given. The man should have had in that time I think eight injections, so that if the physician started with 10,000,000 he should have had injections of 500,000,000 at that time. I thought best to give him a dose which would be much too small and follow it with another one within a few days, so I gave a dose of 100,000,000. He got quite a local reaction from it. What would have happened had I given them the proper dose which he should have received at that time, namely 6 times as much? He should have had about 600,000,000, so it shows how little some physicians know about the use of vaccine. The physician in Michigan who gave the vaccine treatment is very well known as a surgeon in the northern part of Michigan. If he had given the man the proper dose he would not have had any reaction from 100,000,000 injection. But if I had given 600,000,000 as I would have if I had given the previous treatments personally, I do not know what would have happened. Some little bird had whispered to me "don't."

A second point with reference to the case that had no pus. This man's teeth were very loose. He had four or five extracted, and some of those he has now ought to have been extracted. The teeth were all loose, and on squeezing the gums I was unable to get any pus. The gums were not red. They looked sluggish; they looked catarrhal and nasty. There was no pus nor anything of that kind, but deep pockets with teeth very loose. Urinary findings were about normal but he had enlarged liver and a yellow cast in his eyes. He had gotten much better from the use of vaccine. His liver was two fingers breadth below the normal line originally. He is feeling fine, his eyes are clear and the pyorrhea is much improved.

What Dr. Kester stated about vaccination in China is interesting, and I did not know it. It shows there is nothing new under the sun,

He made a rather important point regarding immunity in a community, stating that where measles was formerly unknown, it was more severe than it is with us. That is quite natural. You can produce immunity by the injection of vaccines, and you can also produce a *degree* of immunity through means of heredity with immunized animals and beings. Pasteur proved that by inoculating some chickens with chicken cholera vibrios and allowed them to breed a flock of young ones. To this flock he later added some infected fowl with the result that the entire lot of young ones proved its immunity to chicken cholera.

Such a marked degree of immunity is not always attainable in human subjects but it is true that many infectious diseases have shown themselves far less virulent in nature in the offspring of parents who had been infected and suffered from those diseases. That is why syphilis is not nearly as bad in our community as formerly generally speaking and is why some of the exanthematous diseases are not the dreaded scourge any more which they formerly were and why this community of which Dr. Kester spoke, suffered so badly from an epidemic of measles which up to that time had been unknown to that community.

DR. KESTER :

Do you not think that there is an inherited immunity as regards measles?

DR. SCHUHMANN :

Yes; that is quite natural. A mother immune to measles will convey *part* of the immunity. It is a fact that people who are immune will convey at least partially this immunity to their offspring.

Someone made the remark that pyorrhea might be due to one particular germ. That is a thing that has been going on in my mind and many minds for sometime. But so far is a mere idea. In every case of pyorrhea where I have made a smear and examined it, after staining with methylene blue, and fixing it, examined under the microscope, I have found the presence of spirillæ. Whether the spirilla has anything to do with pyorrhea or not, I do not know. We cannot propagate spirillæ sufficiently well to get any vaccines from them, but the time will undoubtedly come when somebody will probably get the spirilla alive and make a vaccine with it.

What has been said with reference to the *absolute cure* of pyorrhea is well taken, and I can only say I have seen the same results. I have seen lots of cases that were supposed to be *cured* by very able men, men whose manual dexterity could not be doubted. For instance, take Dr. —, surely he had wonderful manipulative ability, but I had a number of his cases under my care that still had pyorrhea after he got through with them.

The interest of physicians in this matter is very great and a number of them are much interested in the subject. One of the leading medical men, of this city, has talked to me by the hour over the use of vaccines, and he is very much interested in their use in connection with dento alveolitis and its influence in general disease and is delighted at the prospect of dentists taking up their studies in a scientific manner.

Of the cases I have had one is a woman who has polyarthritis. Incidentally she is a hemophiliæ and bleeds very easily and profusely. She is a great eater of oranges and grapefruit. The polyarthritis is confined to her left arm. The index finger, the small finger, the second phalangeal joints were enlarged and she could not bend either one of the fingers. She had no pyorrhea, but had a crown on an upper central incisor, the root of which was split. There was a fistula discharging pus, the discharge being rather watery, and not a green thick pus. It is what we call a serous pus. Before extracting the root I made a culture of the pus and had some autogenous vaccine made. I took out the root. She was wearing a small plate, so I put the tooth on the plate, she wore it for four weeks with no more discharge from the gums, but nevertheless there was arthritis just the same. A physician suggested that her tonsils be taken out. She came back to me and asked my advice in regard to the matter. I told her that while the removal of the tonsils *might* relieve the polyarthritis, she was to tell her physician that it was a serious matter to take out her tonsils, for the reason that she was a hemophiliac. She had not mentioned that fact to him before. To remove the tonsils in a woman forty-four years of age, and a hemophiliac would be a serious matter. She went and told the physician what I had said, he called me up, and asked me what I thought she had better do. I suggested that possibly an autogenous vaccine might do some good. She has had nine

treatments with vaccines, and has practically no more arthritis, and no swelling in the fingers whatever.

Another case I had was a young girl, a school teacher, who was covered with acne so bad that she had practically made up her mind to give up her position. She was a good looking girl, if it were not for this terrible disfigurement. She had pustules all over her face, with a pronounced case of pyorrhea; I made an auto-genous vaccine from the mouth and from the acne pustules. She is now cured. Her skin is as fair as any young girl's. She received 25,000,000 of the streptococcus and 75,000,000 of the pneumococcus to each 100 million.

Dr. Medalia has claimed that many cases of pyorrhea will be cured by the vaccines. I would not want to say that vaccines will cure a pyorrhea case alone, nor will local treatment, because the cases that have come under my observation are not sufficient in number to warrant me in making such a statement. I am sure of this, however, that these patients tremendously improve after the use of vaccines, and all of them have lost all the concomitant symptoms they had. Take the case of the gentleman whom I treated and who had interstitial nephritis, having had four or five teeth extracted, but in which case several other teeth were badly affected with pyorrhea, possibly the extraction of the four or five teeth had something to do with curing the pyorrhea in his case, but I would not like to make the broad statement that these vaccines will *cure* pyorrhea. I would not undertake to back up such a statement for a minute. The vaccines will ameliorate the flow of pus, but if an irritant is left behind, I doubt very much if the vaccines will cure the pyorrhea. In eighty per cent of the cases I mentioned there was a deficiency some place, either the blood pressure was too high, or the urine showed changes which should not be there in the way of casts, or there was a wrong co-efficient between the urea or ammonia, or urea to some other urine content, or the blood count was not right. At any rate, *something* was wrong in one of these in each case. If a man can be cured of interstitial nephritis he will not get Bright's disease, and if you let such cases alone they will contract Bright's disease and they will die in the course of two or three years. That of itself is sufficient reason to investigate this question thoroughly. If pyorrhea is really as infectious as it seems

to be and so liable to create bodily disturbances, and we can absolutely stop the ravages of pyorrhea constitutionally, we are doing a great deal and the matter is surely worthy of further investigation.

I want to thank you all again for the many kind words you have said in my behalf and also thank you for your long and kind attention. I also want to apologize for this disjointed response but taking up the replies to questions in such order as they were asked makes the reply rather disjointed.

CHICAGO DENTAL SOCIETY.

MEMORIAL EXERCISES.

Memorial exercises were given for Dr. George Washington Cook and Dr. J. N. Crouse, under the auspices of the Chicago Dental Society, at the First M. E. Church, January 20, 1914.

The meeting was called to order at 8:00 p. m. by the president of the Chicago Dental Society, Dr. George N. West.

Music befitting the occasion was rendered by the Oak Park quartet.

Prayer was offered by Rev. C. M. Filer, Pastor of the First M. E. Church, Hebron, Indiana, after which Edmund J. James, L. L. D., president of the University of Illinois, was introduced, and delivered the following address:

ADDRESS OF PRESIDENT JAMES.

Mr. President and Gentlemen: On behalf of the trustees and faculties of the University of Illinois I desire to testify to the faithful and earnest service which Dr. Cook rendered to his profession through his work for the University of Illinois. I think those of us who are engaged in what may be called the professions or callings which have a distinct recognition on the part of the community, have a privilege which we sometimes do not thoroughly apprehend in securing for any work we do the recognition which comes to the profession to which we belong. Any man who is a member of the great medical profession, or the great legal profession, never does anything that is worth while which serves the interest of that profession without receiving a magnified return

through the very influence of the profession itself upon the public mind and upon public destiny.

I did not have the pleasure of a very intimate personal friendship with Dr. Cook. I may say that I did not know him very intimately even. Personally, I knew him only as one man knows another when he is brought into regular and somewhat routine contact through the fact that they are connected administratively with the same institution. Dr. Cook was busy, and I was busy; we rarely saw anything of each other except in the conference room with the other members of the faculty, or in the conference room alone, discussing the work and prospects of the department for which he was immediately responsible. I found in him always what seemed to me a sound adviser—a man who was deeply interested in the best things for which the organization stood, and of which he was a part. And I always felt that when I asked him for his opinion upon any important matter connected with the school or profession, so far as the school might have a policy affecting that, I was getting an honest response. That is about the highest compliment that one man responsible for large administrative affairs could pay to another who is associated with him in the conduct of such affairs. It may seem a very simple thing, but it is the most complex of all things for a man to give absolutely an honest opinion in a matter concerning his relation to his fellow men—the men who are engaged in the same profession with him—in regard to all practical things affecting that profession and all the things which ramify out from his life into a thousand and one directions, tying up with relations to other personalities. For my part, I know no higher compliment to give a colleague on the administrative side than when I say I feel that his judgment was an honest one, and with no tinge or admixture of any personal consideration whatever.

I remember on two or three occasions talking with Dr. Cook about the work of the dental profession. He had, it seems to me, very large views, and he had thought them over and was intimately bound up by all his intellectual and heart inspirations for the higher things in the calling to which he had devoted his life. I remember one evening very well when we had fully two hours' conversation on the subject of dental education and the dental profession. And in that quiet and leisurely way, which was characteristic of the man,

he spoke with intense conviction and with great feeling upon what he felt to be the necessary steps in the development of this calling of dentistry, he said, into a profession. "I do not know how it is to be done"—I am quoting him largely in what I am saying now about this particular subject, for it made a deep impression upon my mind, and it affected my own views and policy in more directions than one. "I do not see," he said, "how this is going to be done, making a learned trade a learned profession, except by the better education of the men who are engaged in this calling. I think," he said, "that a profession separates itself from a mechanical calling primarily by the element of scientific training and scientific work in it and the liberal education of the man who pretends to practice it. We shall never have a learned profession until every man has the kind of liberal education which will enable him to hold his own views in a community along with other educated men. When he has that education it will make his advice in the community on all communal affairs worth as much as the advice or opinion of the lawyer, the physician, or the clergyman, and everybody will recognize that to be so. And that is the result of a liberal education, whether obtained in the schools or not, not of technical and professional education. At the bottom, it is the result of a wide outlook over human interests and a wide view of the problems of human society and not the result of special study of some particular part of the human anatomy, although this is also a fundamental thing. Men should take up a liberal course of study before they undertake the study of dentistry, which means that we are not to be content with our present standard of preliminary education for admission into a dental school, the general training implied in the high school curriculum, but it means whatever may be necessary in addition to that to make sure that the man who is entering upon the calling has the basis of that liberal training and liberal education which will secure for him as an individual and as a member of the profession and the society of which he is a member, that place which belongs to the members of a learned profession. That is not all, by any means. The rest of it will turn largely on what the character of that professional or technical training may be. I am not inclined to underestimate at any point the necessity for that fine manual training and that manipulation which is so fundamental to excellent work in this calling. I think we must insist upon that at

any cost, no matter what else happens, because that is the condition of being a dentist, and we must of course be able to do the things which we pretend to do. And it must be taken rather for granted than as a part of a larger training, that something which is the condition of the training, not essentially to be regarded as a fundamental part. But, after all, the thing which is going to give us standing in the world of thought and the world of scholarship and the world of the learned professions is the scientific element which enters into this work, not the mechanical or industrial or trade element. To make that worth while, we wish to insist on a scientific training of the members of this profession. Some physicians and some surgeons talk about our profession as if it were a mere subdivision of surgery, or as if it were a mere specialty. In fact, the attitude of the medical profession for a long time, and the surgical profession, was that dentistry is a mere specialty inside the field of surgery; and that it ought not to be dignified by giving it a special place in our university systems. But," Dr. Cook said, "it is a specialty that is universal, and that is what makes it worth while to be put into a separate class by itself." He contended that dentistry was as much a specialty of medicine as dermatology; that it was so universal that ninety-nine per cent of the human family required services of dentists at some time or other, and while from one point of view it might be called a subordinate specialty, it was so universal and so important that dentists claimed for it the recognition they were demanding. He said it was absolutely necessary for the dentists to study the problems connected with the teeth and mouth scientifically if they would make their calling a profession.

So he went on in this leisurely, very definite, and sometimes half dreamy way laying out some of the conditions for making this mechanical calling a great and learned profession. What he said made a deep impression upon my mind.

During his life, so far as I knew him in connection with the University of Illinois, he stood for this policy wherever he could honestly, with no shadow or variableness of turning. He was a man whom everyone learned to respect who became acquainted with him—a man whom we all feel became a leader in the line in which he was at work. The University of Illinois testifies from the men

in every department who knew him that he was a worthy member of the faculty.

HIS CONTRIBUTION TO DENTAL EDUCATION.

DR. DONALD M. GALLIE:

Mr. Chairman, President of the Chicago Dental Society, Ladies and Gentlemen: I have been selected to speak on the subject assigned me because I have been associated with Dr. Cook in teaching longer than any man present. I regret very much that the gentleman who could so fittingly speak on this subject is, on account of illness, unable to be with us this evening. He has suffered since last October a severe illness and it has been necessary for him to leave this section and go to the sunny climate of the South to convalesce. This subject should have been spoken to by Dr. Dittmar, who was associated with Dr. Cook longer than any other one teacher. If I remember rightly, Dr. Dittmar began his teaching under the guidance of Dr. Cook in the Illinois School of Dentistry.

We see by the program that speakers will tell about Dr. Cook's contributions to dental science; that some one will speak on friendship, and another member will speak on Dr. Cook, the man. We have many men who contribute to science, who write for our dental literature; we have lots of friends and friendships, and some of our men have made their impression upon the world, but the world provides but few teachers, men who can guide, men who can teach, men who can inspire the young man or the old man to start out right to accomplish something; to start on life's work under favorable conditions. The world produces but few natural teachers, and so while Dr. Cook will long be remembered as a contributor to dental science, and as a friend, and everyone who ever came in contact with him will cherish the thought that he knew such a man, yet it is as a teacher, as a director of dental education, that Dr. Cook's name will live longest. As a man and as a friend and as a contributor to dental science, he is one of us. As a teacher he was an inspiration; a man who set the example, who inspired young men to their best efforts not only in their chosen work, but by his life and his example he guided them not only into the channels of dental education, but also into the avenues of good citizenship and good men, because he was a man of that type.

I will never forget the first time I met George Cook. We both graduated at the same time; he in the neighboring state of Iowa and I in Chicago. Shortly after he came here it was my good fortune to get acquainted with him, and I asked him one day what he was doing. He said, "I am fitting myself to teach the future members of our profession how to combat diseases of the oral cavity, not through reparative processes, but by the process of prevention," and that was the first time I knew he was greatly interested in the science of bacteriology. Shortly after that he became connected with one of the schools and practically all through or during his professional life not only has he been an example to the profession as a true professional man, but he has been the guide, the inspiration, the teacher of the young man, and his memory will live longer than the time of our life, because since 1894 he has been teaching young men how to combat the ravages of disease, and that was carried on from 1894 up to 1912, and when he retired as a teacher he was then taken up by the Natural Research Committee to delve into the mysteries of the science that would unfold to us means of combating a disease which is so prevalent in the world today. In 1894, after he was here a couple of years, he became associated with the old American College of Dental Surgery as a lecturer on histology. Soon after that the school was absorbed by the Northwestern University Dental School. Dr. Cook became a member of the faculty of the Northwestern Dental College and was there for two years and received the professorship on bacteriology and histology. When that school was absorbed by the Northwestern University school he shortly afterwards became associated with the Illinois Dental College, which afterwards became the dental department of the University of Illinois, first as a teacher of histology and bacteriology, later professor of bacteriology and pathology, and still later professor of bacteriology, pathology and therapeutics, all these years giving the best of his time, the best that was in him to educate and to guide the young man. If you will stop and think, the work Dr. Cook was called upon to do was not such as would appeal to the young man, and the subjects were not such as would appeal to many of us at the present time as readily as the more practical subjects, such as that of operative and prosthetic procedures, you can realize what he had to contend with. But it was the science in which he was

interested, and you know that twenty years ago it was hard to make a student—yea a good many members of the dental profession—believe or feel that the science of bacteriology, the cause of disease, was important for a dentist. It was hard to make them understand and even today it is hard to make them realize the importance of a study of histology, but yet Dr. Cook gave all of his time and his life to teaching and to inspiring and to creating within the young man a desire to understand the fundamental science, and he succeeded. When he first started there were but few teaching the subject of bacteriology. In fact, I know of but one or two throughout this country in the dental colleges that were members of the dental profession who were capable of teaching this science. Fortunately, Chicago and Illinois can boast of another one who was a pioneer as far as teaching in the colleges of this country is concerned the subject of bacteriology. I refer to Dr. G. V. Black, who, I believe was the first, and then Dr. Cook came into our midst, and there were but few throughout the whole country or the whole world teaching this branch, the connecting link between the science and art of dentistry. This connecting link was not understood, and so until the time he was called away he devoted his life and his time to teaching this science and his efforts were crowned with success. Today we all realize the importance of these subjects throughout the length and breadth of the country, and we hear of classes being formed by this great national research body. We have in the city of Chicago and many of the larger cities classes for the purpose of studying bacteriology, pathology and histology, the sciences that were not understood by the men attending these classes, who did not have the opportunity of studying them under such teachers as Dr. Cook. It was not as interesting for students as the subject of filling teeth, or the restoration of dentures, and although the subject was hard to understand, yet he had the love, the respect and the attention of the student body.

In 1906 a change in the faculty of the Dental Department of the University of Illinois took place and Dr. Cook was elected its Dean, and as an associate in the faculty and as a leader in the school afterwards his interest and his heart were always with the students. He was the friend of the student. Those of you who know anything about dental teaching know there is a time when it is necessary to exercise some discipline. Our dear friend George

made a feeble effort as a disciplinarian, but his heart was too big and too soft when it came to letting students go too far, and when he undertook to decide whether a student should be disciplined in a way that would be an example to the others, he was always there with an excuse; he would always say, "Give him another chance," and it is needless to say the boy got another chance, and I am not prepared to say but what that is the best way of handling students. And so it was all through his course as a teacher, he always had the interests of the students at heart. He did his best to educate the students. He did his utmost to train them. He tried to set an example for them to follow, so that they would be a credit to the profession, a credit to the country, and be successful practitioners.

As there are others to follow me this evening I can only close by repeating the beautiful words we find on the inner page of the program:

"We place our wreath of immortelles on his tomb and turn our faces toward the east to live better and more noble lives because of the touch of his life on ours."

HIS CONTRIBUTIONS TO SCIENCE.

By DR. C. N. JOHNSON:

The measure of a man is gauged from various points of view. It may be his fidelity as a citizen, his steadfastness as a friend, his fairness as an opponent—it may be his ability, his genius, his honor, his liberality, his bigness of heart, or it may be even his eccentricities or his peculiarities. In some way the distinguishing characteristics of a man stand out to mark him among his fellow-men, and it is these things, mellowed by the hallowing influences of the "Great Mystery," which live with us and impress us most after the man has gone from our midst and said to us his last farewells.

Dr. George W. Cook was a man of many parts. He was blessed with the softer graces of life, the more human and lovable traits which attracted men to him and held them in a permanent friendship. But it has been assigned to me to speak of another side of his activities—his contributions to science. While he was eminently a companionable man he was in the final analysis essentially an investigator. It was as natural for George Cook to delve into the

intricacies of phenomena and fact as it was for him to breathe. In every spare moment he was busy with the microscope and the test tube, and the only reason a larger mass of material did not appear from his pen was because of his exceeding conservatism and his innate modesty in recording conclusions. He was never ready to publish anything until he was perfectly certain of its accuracy.

I am indebted to Drs. Arthur D. Black and J. E. Hinkins for a list of some of his contributions.

The following papers were read before the Illinois State Dental Society:

"Bacteriological Investigation of Pulp Gangrene," 1899.

"Report of Committee on Dental Science and Literature," 1907.

"Putrefaction and Pathological Changes in Tissue," 1908.

"Some Phases of Bacteriological Infection of the Human Mouth," 1912.

Aside from dentistry proper we find him contributing articles for the Biological, Chemical and Microscopical Societies, both in this country and Europe. He also contributed the chapter on "Erosion" in the text-book of Operative Dentistry published by P. Blakiston's Son and Co. of Philadelphia, and it is something of a coincidence that less than a week before his death he informed the writer that he did not care to make any changes for revision in this chapter owing to the fact that nothing significant on the subject had appeared since he first wrote it.

With his various contributions to this society you are all familiar—not only the papers he read, but also his most entertaining discussions. It is conservative to state that the Chicago Dental Society is richer in its archives because of his contributions to its proceedings. But to me the most outstanding thing he did in a scientific way was embodied in a paper he read before the Odontological Society of Chicago showing the possibility of tubercular infection through the medium of pulpless teeth. He traced by a series of experiments and observations the tubercle bacillus down through the canals of these teeth into the jaws and to the glands of the neck. Till this time not only the medical profession but in large part the dental profession had grown to look upon the presence of pulpless teeth in the mouth as representing a passive

rather than an active harm, unless perchance they developed an alveolar abscess. But in this paper Cook awakened the profession to the grave danger of leaving these pulpless roots open in the jaw, and it is safe to affirm that as the result of his work the mouths of many individuals, particularly those of children, have been rendered healthier, and the patient has thereby been given a better chance in life for position and preferment.

With the name of our dear departed friend I have been asked by the program committee to link the memory of another man who has just passed from our midst. In all the category of names which from the beginning have adorned the pages of dental history no one stands out in bolder relief than that of John N. Crouse. Cast in heroic mold and original in the highest degree, he stood out as one of the most commanding figures in the dental profession. It is not for me at this time to portray his many excellent qualities. This mission has been entrusted to abler hands than mine, and yet before I close I beg to be permitted to sound my meager meed of love and praise to the memory of these two men who have meant so much to us in this Society, and whose passing has been so great a loss to the profession and to humanity at large.

Men come into the world to strive, to struggle, to achieve, to attain. After a brief span they lay down their load for other men to pick it up and mayhap to carry it a little farther than they. And that is all!

It is well that we meet to pay tribute to the memory of the noble dead. It recks not aught to them, but to us it opens the well-springs of our sympathies, and floods us with the benediction of our bereavement. No where has man lived in vain or died in vain if his living or dying has pointed the way to a better life for his fellow man.

And we learn of better things in contemplation of the lives and works of those who have gone before. Let us not mourn—let us rejoice. Let us not mourn that their task is done, their burden borne, their message brought. Let us rejoice that they wrought so well, so lovingly, and so long; and that now after the fitful fever of circumstance and chance, of stress and strain, they are folded peacefully in the mantle of their eternal sleep.

HIS FRIENDSHIP.

By DR. I. G. REID:

I esteem it a rare privilege to be the one selected to represent the Odontological Society of Chicago upon this occasion. Surrounded as we are at this time by the presence of a great multitude of loving friends assembled for but one purpose, and that is to pay a lasting tribute of respect to the memory of Dr. George Washington Cook, who departed this life on the evening of December 21, 1913, at 8:30 o'clock.

If the friend of whom we now speak was called upon to preach a sermon to this audience, the text selected would read about as follows:

"If you're leadin' an army, or buildin' a fence
Do the most that you kin with your own common sense.
One small word of praise in this journey of tears
Outweighs in the balance 'gainst cartloads of sneers.
The plants that we're passin' as commonplace weeds
Oft prove to be jes' what some sufferer needs.
So keep on a-goin'; don't stay standin' still,
Some people won't like you, but most folks will."

The few lines quoted in the above stanza are as a mirror reflecting a picture of this man's qualities. A brief history of Dr. Cook's very early life will I am sure be of interest to many of you.

He was born in the state of Kentucky—place I do not recall—on January 19, 1866. Some three or four years thereafter the parents with their small family, comprised of John C. Cook and George W. Cook, transferred their belongings to southern Illinois, locating in the neighborhood of Carbondale.

The parents both died not very long after removal to this state, leaving George an orphan at about the age of eight years.

Deprived of parental influences and a depleted exchequer, in comparatively a strange land, at his age made the outlook to George somewhat dismal. However dark the abyss may have seemed the sturdy boy gathered himself together with a firm determination to overcome the obstacles which had thus far befallen him by going to work on the farm. The compensation received for the performance of chores done was something to eat, a place to sleep and some clothes to wear, the latter of which I have heard

him say "touched everything and covered nothing." The boy struggled along "doing chores on the farm" for a period of time until by chance an opportunity presented whereby he fell heir to a home with a physician, whereat the lad soon became quite proficient not only as a good coachman, but as an expert assistant in the field of surgery.

I shall never forget the sarcasm which played over his innocent features when he first related to me about his promotion, as "first assistant surgeon" to a country doctor. The duties assigned to him as first assistant surgeon were to take charge of the patient and chloroform him, which he said he always did with no degree of uncertainty, in fact he said he sometimes had some doubt as to the necessity of further surgical interference. The experiences encountered in the office of Dr. — were always filled with amusing incidents to him.

Occasionally the doctor would for some good reason act as his own coachman, and leave the first assistant custodian of the office with explicit instructions to administer to the wants of callers as best he could; during the interval of absence—a patient calls, who proves to be a stranger. The first assistant's inquiries soon divulge that something was out of gear, and with this meager information at command, he would disappear into the mysterious back room—labeled, "Private." After a few minutes of intermission he would emerge with a six-ounce bottle, filled, nicely corked and beautifully sealed, with written instructions—"One teaspoonful every two hours." This favorite and universal concoction was sweetened water, a squirt of peppermint essence and some coloring matter. This prescription served a temporary purpose in tiding over the anxieties of the stranger, at that particular time.

The employment in which he was engaged at this date, proved to be the prominent factor which determined him to turn his attention to the study of medicine. The reading of medical text books was so full of infatuation that he many times saw the dawn of day approaching before retiring to rest. His reading of medical literature made him quite conscious of the fact that his preliminary education was somewhat at fault, and that provision must be made to correct this deficiency; he therefore availed himself of such privileges as the community school offered, and went to work with

a vigorous determination to equip himself to meet this deficiency. Coincident with the school work he never lagged in his enthusiasm for medical information.

Thus having prepared himself as well as time and circumstances would permit, a second opportunity presented whereby he could better his condition by accepting a position in the insane hospital located at Anna, Illinois.

In this institution he had full charge of the drug department. The knowledge he had acquired from the study of *Materia Medica* prior to this change, was sufficiently comprehensive to enable him to fill the place thus assigned. This position offered him many advantages for further training along pharmaceutical lines. His stay at the hospital was not very prolonged, as his strongest ambition was to enter a medical college to complete an education in medicine and here we find him coming to Chicago, and at the solicitation of his brother,—who was at this time an M. D., he matriculated in The Northwestern Medical College and attended one full course of lectures, but at the close of the last semester, for some reason best known to himself, he concluded to take up the science of dentistry, as the final choice of a profession. He matriculated in the dental department of the Iowa University and was graduated a D. D. S. from that institution in the spring of 1890.

Immediately thereafter he located an office in that part of Chicago, then known as the Town of Hyde Park, where he practiced his profession continuously to the time of his death.

The interval of time in waiting for practice, was utilized to a large extent in cultivating his already inquisitive mind for higher scientific attainments. The habit of reading anything and everything, was of inestimable value, as it enabled him to make choice of just such subjects as were specially fitted to his liking, for a future investigation. One of Dr. Cook's chief gratifications was his strong desire to employ his talents in such a manner as would be of benefit to somebody. This philanthropic gift was distributed in a manner most becoming, and in the most unostentatious way.

"He never had a secret that would be helpful to others, that he did not labor industriously to communicate to his professional brethren."

In the foregoing brief narrative I must not overlook to mention, that the latter years of his life were devoted largely to the study

of biology, bacteriology, pathology and physiological chemistry; and to the inquisitive mind the subjects named furnish an inexhaustible supply of material for scientific investigation, and it was in these fields of science wherein his love for labor was not lost. His contributions to dental literature were usually upon some one of those branches, and it can be truly said, that he rarely ever penned an article unless it contained something new and which was observed or discovered by his own individual efforts.

In behalf of the Odontological Society of Chicago, the foregoing brief history is sincerely dedicated. Dr. Cook became affiliated with this society on March 8th, 1904. He was honored by being elected president on Nov. 13th, 1906. I am sure the members will bear me out, when I say that of the few members coming into its fold during the recollection of the narrator, not one has been received with a greater confidence of what was to be expected of a man than Dr. Cook.

To him as a member of the society "meant active participation in the work of this body, and the records of the society show how faithful he was" in the doing of whatever he was called upon to do. Therefore as an organization we honor ourselves by paying proper tribute to his memory.

The present living membership of the society have touched elbows with him for almost a decade. The hour of repast, was the one place in our society life, wherein Dr. Cook's versatility was strongly exemplified. Being a keen observer on his travels throughout this and foreign countries he was furnished with a fund of stories which he was capable of relating in the most fascinating manner.

I can not recall at the present moment one single individual of my acquaintance who was so endowed with a faculty of seeing amusing situations, as he. His discernment of the funny side of life was most pronounced.

Dr. Cook as a debator of scientific questions in a dental gathering was usually listened to with marked attention. In fact "he was always a surprise when in debate, his deep knowledge of fundamentals and his far reaching study, willing always to have his conclusions questioned, always willing to revise them, and just as ready to question the conclusions of others, no matter whether they might

be the accepted professional and scientific dogma or not." In a discussion he could force an adversary, if there ever happened to be one, with a demeanor that was almost child-like. Criticism was to him a stimulus to renewed activity. In concluding this brief biography I will add that Dr. Cook "acted well his part in the drama of life and that a flood of memories will brighten the thoughts of all who were so fortunate to have known him." He lived his allotted space of time, and going hence he leaves behind him a name which exhales so sweet a perfume that its fragrance will long linger with those whom he has left behind.

DR. GEORGE W. COOK—THE MAN.

REV. C. M. FILER, Hebron, Indiana.

It was my privilege to know Dr. Cook the last six years of his life. Prior to that time I had never heard of him. Professionally I did not know him, for I never saw him in his office, in the lecture room, or before a convention. There is just one way I knew him, that is, as a man.

I think I may speak of him tonight because I knew him when his manhood had not only matured, but ripened.

I know the morn is bewitching when from out the grey dawn the sun is born anew, and the fires of the world are kindled for another day; but the glory of the sun is when at noontide it stands at the zenith, and then majestically but peacefully moves to its setting. And, if its first rays are promising, its last are assuring.

I want to say that since my knowledge of Dr. Cook and my acquaintance with him had to be limited, I am glad I knew him at the last.

I want to speak of him, too, because I knew him yonder. You, most of you, knew him here. You knew him intimately, he was your friend and your fellow; but, here he was a professional. Here he was the scholar, the doctor, the professor, the lecturer. Here he moved in the atmosphere of professional life. When he came to us he left these behind; the professional garb fell away and he stood among us with those more natural and inherent qualities full revealed.

Manhood is glorified by all acquired accomplishments, but the glory of manhood is to be seen without them. Thus I knew Dr. Cook. I want to speak of him here as

A MAN OF REAL MANHOOD.

He was a man who came up to manhood's estate "through great tribulation." It was never more true, perhaps, than in the life of Dr. Cook, that "the boy is the father of the man." Few boys struggle as did he. Few who become what he became have had greater privations than he. Not the privations, wholly, which affect the body, for he never was denied these long enough at any time to cause undevelopment or deformity. His were the unkindlier sort. The kind which buffet the soul and bring the crisis of life in the earlier years. Do you know, I believe there is nothing in life but must be won; and there is nothing worth while that is won lightly. The strength of Dr. Cook's real manhood seems to have been his through the conflicts that early came to him.

Robbed of both parents when a mere lad he suffered the greatest loss that can come to childhood, and was thrown upon the charity of those who had an uncertain interest in him at the age of eight, and from that hour he became the child of destiny and his was the struggle single handed that brought him up to the honor this hour is showing his memory. At the age of eleven he cut loose from all connections and guided only by his very youthful determination trudged all night long and in the morning while sleeping the sleep of exhaustion, once again an angel came to a sleeper and touching him, bade his wandering cease but the struggle to go on; and with both good hands and a determined mind he labored and studied until he won! Such experiences as these poured into the mold with boyhood can have but one of two effects: either they will purify, separating the spurious from the real gold of manhood, or they will alloy and pollute to a malformation.

What were the qualities of this man born anew in the throes of early struggle and christened with the tears of youthful misery? Could such a boy become anything but a hard, shrewd and unrelenting misanthrope? Ah, yes! Some souls under the treatment accorded by the world to Dr. Cook, would have been deadened; but not with him; for I insist,

HE WAS A MAN OF THE BROADEST SYMPATHIES.

I think he felt the keener the sting of life's sorrows for others because they had come to him.

I have sometimes said that we never reach the true altitude of human sympathy until we come where Longfellow was brought by his own suffering as he stood on the bridge at midnight, while the clock was striking the hour; and looking down among the wooden piers where the moon was sinking into the sea like a golden goblet, said, "Only the sorrows of others cast a shadow over me."

Especially was Dr. Cook's sympathy manifested in his attitude toward and his evident fondness for children. It was no uncommon thing to see Dr. Cook on the sidewalk conversing in a most affectionate way with an interested bevy of little people. Their hearts were all his. He was too,

A MAN OF GOOD CHEER.

A jollier soul never lived than George W. Cook. Whatever of hardness life had held for him, and whatever may have been locked in his memory, it was never suffered to chill that spirit. I was struck by the appropriateness of the heading to a notice of him in our local paper; for it read, "A Merry Heart Stilled."

Doesn't it seem incongruous that a life which early has had stamped upon it the seal of privation should become at maturity effervescent with good cheer? Witness the great souled Lincoln, transplanted, too, from the soil of Kentucky to the kind and prolific soil of Illinois:—never a deeper poverty—a more narrowed boyhood. Fate hurled all manner of soul stunting conditions in his path, but out from the bitter years, up a rugged steep to manhood, there emerged a soul that was big with cheer. Fated not only in childhood, and companion of Poverty in the straightened ways of young manhood, he became the sacrificial grief bearer of the Nation; but there never was a day so dark that the smile was not a morning star, and never burden so heavy that his good cheer was not a sunkissed morning.

Such a soul had Dr. Cook. He may have had his Gethsemanes but to meet him was to see radiated from his jovial countenance beams of cheery light. And one could not be long in his company either without realizing that "As in water face answereth to face, so the heart of man to man."

I remember once, a year or two after I first knew him, we had a Christmas affair at the little church from which he was buried, when he had the part of Santa Claus. You may imagine how well he suited the part; how his heart was bigger than the pack he car-

ried, and how he pleased the children with his stories and jokes. I can't but think, somehow, that Dr. Cook's big heart was so filled with great stones trouble that over them the mirthstream rippled and sung.

I have been with him different times on social occasions, such as we have in the country. He was always the life of them all. Last Thanksgiving day I spent with him thus; and that last day. I shall always be grateful I was with him on his last conscious day in his own home. All unconscious of the dark calamity that awaited him and us in the drizzle of that oncoming evening we joked on and laughed on until the bedtime hour, and from that he drifted out to "The undiscovered country from whose bourne no traveler returns."

Such a man was George W. Cook. His soul was good for the world. He made it a winsomer place, and could I design his stone and write his epitaph, I should cut a sunburst and grave beneath it—

"HIS LIFE WAS A LIGHT WHICH CUT UNFRIENDLY DARKNESS FROM THE WAYS OF MEN; A SUN THAT MELTED THEIR SORROWS."

Dr. E. P. Swatek:

Representing the Alumni Association, University of Illinois College of Dentistry:

Mr. Chairman, Members of the Chicago Dental Society, and Friends: Having been chosen to say a few words for the members of the Alumni Association of the University of Illinois College of Dentistry, I would say that in all of our relations with the late Dr. George W. Cook, never were they any other than those of children toward the father of a happy family. He was always willing to do anything and everything that would lend to our support in all matters of class or association, often going out of his way to assist and encourage a member who otherwise may have fallen by the wayside.

New students coming into the college life soon found in him a true friend and counsellor, and many of them reached the point of friendship where they addressed him as "Daddy," and true it was that he took a fatherly interest in every one, giving them an inspiration to want to do their best to please him.

He soon gained the confidence of the student body, and his influence joined us into one big, happy family, and when dis-

cord entered into this family he seemed to possess the faculties necessary to reunite us just as a father would his family, and harmony was supreme.

His efforts were always along the line of seeing how much he could do for his friends, and everybody was his friend. No better illustration of this can be cited than the unselfish and untiring efforts on his part to give to the profession some light on the causes of some of the more obstinate mouth infections, through his research work in bacteriology.

We mourn the loss of so good and so true a friend as the late Dr. Cook, and in conclusion we wish to extend to his widow and relatives our sincere sympathies in their bereavement.

And when he was called by the Supreme Architect of the Universe to His Spiritual Building, we feel certain that He said, "Well done, thou true and faithful servant."

LIFE AND WORK OF JOHN NATHAN CROUSE.

Dr. Truman W. Brophy:

I was asked only yesterday to participate in the services of the evening, and at the time I stated that I was so hoarse I might not be able to make myself heard. However, I am very glad to be here and to pay a tribute of respect to a friend of many years.

John Nathan Crouse, D. D. S. was born September 15, 1842. He died January 16, 1914.

Dr. Crouse was born near Towanda, Chester county, Pennsylvania. His early education was in the average schools of Pennsylvania, and then in Mt. Carmel Seminary from 1859 to 1862. He received the degree of Doctor of Dental Surgery from the Pennsylvania College of Dental Surgery in 1867. He began the practice of dentistry in Mt. Carroll, Illinois, in 1864, and since 1868 has been in practice in Chicago. He was the last surviving charter member of the Illinois State Dental Society. He founded the Dental Protective Association and was its president until December, 1913. He was a member of the National Dental Association, the Chicago Dental Society, the Calumet Club, and many other organizations. On June 16, 1864, he assisted in organizing the Chicago Dental Society. In the following May

the Illinois State Dental Society was organized. In 1886 he founded the Dental Protective Association and the Dental Digest in 1895. At the coming meeting of the Illinois State Dental Society in March it was intended to signally honor him. In January, 1867, I came to Chicago, and among the first members of the profession I met was Dr. Crouse, so my acquaintance with him has extended over a period of forty-seven years. When the Chicago College of Dental Surgery was organized in 1881, Dr. Crouse became a member of the board of Directors; he served in that capacity many years, and the success that the college met in its early experience was largely due to his wise counsels. He always stood for thoroughness in the work. Dr. Crouse, among all men, was noted for his success in practical dentistry. He believed in thorough technical training, and it was upon these lines that the institution I have named inaugurated a course of instruction in technical work. He stood for the best in dentistry. In years to come, long after most of us have passed away, his name will be mentioned, and he will be regarded as the man of his time who stood for the highest ideals in operative dentistry. It is in the field of operative dentistry that he will be known in the years to come. Dr. Crouse was not only a member of the Board of Directors of this College, but he was Professor of Hygiene for some years. In his inimitable way,—for he possessed in the highest degree an amount of energy and enthusiasm in everything he undertook,—he will be remembered by those who knew him, for he taught those boys, many of them are here tonight, in a most positive manner the importance of observing the laws of hygiene. While at that time this department of college training was not particularly popular, today oral hygiene is the greatest subject before the medical and dental professions.

Dr. Crouse as a student was recognized as always being progressive. He looked upon the affairs of life in a practical way. He believed in men doing things with all their might, and those of you who knew him, know how well he carried out those principles. Whenever in a society the discussion lagged and the work of the association seemed a little dull, someone would call for him, and then with the magnetic enthusiasm which he put into the discussion everyone would be aroused, and the de-

bate would take on a life and activity beyond anything that had been anticipated. As the result of my discussions with him,—and sometimes he discussed subjects in a way to criticise my methods,—I owe to him I think more than to any man what I have achieved in association work. He would put one on the defensive, and when on the defensive he would resort to all the means at his command to bring a man out.

In the National Association Dr. Crouse was the life of its members at all times. The most celebrated men in the profession found the steel of Dr. Crouse was worthy of any that could be advanced. The young men in the profession will find in the literature of dentistry through the years the discussions which he entered into, most valuable reading, because the principles that he laid down in the field of operative dentistry are good today and I believe in the years to come they will endure.

Forty-seven years of acquaintance with a man in the same city means a great deal. I have seen him in the very ecstasy of life, when everything moved along so beautifully. In association work in which he was particularly noted, everything moved to his satisfaction largely through his own efforts, and then I have seen him when in the excitement of the hour the members of the profession were threatened with burdens which they could not bear, arise in his full strength and declare that these impositions upon the members of the profession shall not be. Those of you, who knew him, know how hard he worked, and how he laid aside his personal affairs, every selfish interest would prompt him to observe, and took up the burden of the profession and saved its members from these impositions. Dr. Crouse has traveled over this country from the North to the South and from the far East to the far West, making personal sacrifices to accomplish the work which he felt should be done to protect the members of the profession. The great debt that we owe to him never could have been paid. You know how men with designs, such as existed prior to his activities, sought to crush out the business lives, the professional lives of men, but they were prevented from so doing by him. If Dr. Crouse was pictured in his true light, he would be pictured handing to the

dental profession the achievements of his work and telling them to take this work of his as a gift to the profession.

I cannot say too much of the work that was done by him. Having been more than twenty years associated with him in the Dental Protective Association, I know so well his anxiety and care that no advantage should be taken of the members of the profession. Those of you who went to him for advice know that he would tell you to do so and so and his judgment was good.

Those of us who are permitted to live a little longer and continue to perform the duties that are assigned us will remember him as an energetic, worthy member of the profession. When I heard by telephone of the death of Dr. Crouse a feeling of profound sadness filled my heart. Not many of the old coterie are left, but we will do our best as he did to assist the young, and may we not in the years to come have said of us that we had in our hearts that genuine good fellowship and love for our kind that he possessed in the hours when he was laboring so hard for us. He has gone from us. We will miss him. No gathering of dentists in this country, in the national or state societies, will occur without the mention of his name. He should be mentioned in the way that I have stated as the man of all men who made it possible for the young dentist to pay for his home, to establish himself in a community without being molested by designing men. It will be said that he furthered the best interests of the profession in all of his duties of life. I do not think a day or an hour passed scarcely that he was not looking for some plan or some work to pursue to benefit the dental profession, and such a man we will surely miss. As the years pass by others will come forward and become leaders of men. The example that was set by Dr. Crouse will be one of the most worthy to emulate.

TRIBUTE TO THE LIFE OF DR. J. N. CROUSE.

Dr. J. P. Buckley:

Mr. Chairman and Friends: The impressive services of this evening will long be remembered by every one present. In our humble way we have endeavored to pay our tribute to the character and worth of two great lives. The most of us here assem-

bled were friends and intimate acquaintances of both Dr. George W. Cook and Dr. J. N. Crouse; and whatever is said or done under circumstances and conditions like these, when our minds and grieving hearts are the more capable of responding to the finer instincts of our being, will leave its indelible effects; and, I hope, will serve to help us live cleaner and better lives.

I have been asked to say a few words on the life of our departed friend and co-worker—Dr. J. N. Crouse, whose life terminated last Friday evening, January 16, 1914, at about 7 o'clock.

It is not my purpose or intention to recite here a long eulogy of the man whose life and actions speak so eloquently for himself. I knew this man as few men know another. First I knew him as a successful dentist, then as a friend; later I knew him in his home, where I saw how devoted he was to his loving wife and how solicitous he was for the success and welfare of his son. To include it all, I can say that I knew him in every relation of life.

Eight years ago Dr. Crouse lost his older son, Howard. He was a promising son, of whom his father justly expected much and on whom he had learned to depend. This was a sad blow and from the effects of which Dr. Crouse never fully recovered. It was shortly after this that he singled me out from among the younger men of the profession; to an extent he made me his confidant, and we became very friendly. Just why I was thus selected, I never knew; but he unconsciously made me feel that, to a degree, I was taking the place of his dead son. This friendship steadily and gradually grew until it ripened into a feeling which is difficult to describe. During the last three or four years there has scarcely been a week, excepting the last few months when he was not feeling so well, that he did not come to my office—not only once, but many times a week. We lunched together, in my machine we rode together, we were pals; and, like real pals, we would sit by the hour, reviewing the past, analyzing the present, and “dipping into the future far as human eyes could see.” we, too, at times, “fancied we saw the visions of the world and all of the wonders that was to be.” He was the youngest old man I ever knew; in appearance, in actions, in

spirit, and in thought. He was as true as steel and as pure as gold. Do you wonder that I grew to respect him as a son respects his father; and I am certain that he had a fatherly interest in me.

When Tennyson was writing his master piece—"In Memoriam," after the death of his dear friend, Arthur H. Hallam, and said,

"My Arthur, whom I shall not see
Till all my widow'd race be run;
Dear as the mother to the son,
More than my brothers are to me,"

he was criticised and taken to task by his brothers for making the last statement. Later on in the poem, Tennyson explains how such a thing is possible. Here he says,

"More than my brothers are to me,
Let this not vex thee, noble heart!
I know thee of what force thou art
To hold the costliest love in fee.

But thou and I are one in kind,
As moulded like in nature's mint,
And hills and woods and fields did print
The same sweet forms in either mind.

For us the same cold streamlet curl'd
Thro' all his eddying coves; the same
All winds that roam the twilight came
In whispers of the beauteous world.

At one dear knee we proffer'd vows,
One lesson from one book we learn'd,
Ere childhood's flaxen ringlets turn'd
To black and brown on kindred brows.

And so my wealth resembles thine,
But he was rich where I was poor,
And he supplied my wants the more
As his unlikeness fitted mine."

Oh! how true in this instance, "his unlikeness fitted mine." Not only did some of the virtues of Dr. Crouse supply some that were wanting in my own life, making me happier, and, I hope, better, but you know and I know that the influence which this great man unconsciously wielded with the young men of our profession has stood for years as a power for good, as an incentive for nobler deeds, for higher and better and purer thoughts; it has nerved us on to greater achievements.

As we bury our dead, then, let us seek some lesson that may be suggested by the life and death of our friend. First, in my thoughts is the lesson which the young men who are yearly entering our profession can learn from the career just closed. It is not obscure nor difficult. It teaches the value of hard work, coupled with proper recreation. Dr. Crouse was a tireless worker; yet he took time occasionally to fish and hunt, and was considered one of the best marksmen of his time. Still another lesson teaches us more impressively the fact that the road to usefulness and to the only success worth having can only be reached by one who is honest, truthful, unselfish, moral and clean in every relation of life. The man of whom I speak was such, and he reached the highest pinacles of success. He was a devoted husband, a kind father, a good citizen, and a true and loyal friend. Dr. Crouse was a born leader and he numbered among his staunchest friends the best men in his profession; but, like most leaders, perhaps, he made a few enemies. But his courage, sincerity, kindness, resourcefulness, wit and humor disarmed hatred. In all the years that I knew him, I saw him angry but once. This was when he thought an attorney had taken advantage of his frankness and honesty and was trying to trick him. Later when he learned that his suspicions were unfounded, he promptly apologized.

Let us make no mistake. Here was a distinguished man, a great man, a useful man—who became distinguished, great and useful because he had retained, unsullied and unimpaired, those qualities of mind and heart which, I fear, all of us do not possess.

Dear friends, I am done. My friend and your friend is dead. The voice we loved to hear is stilled. Dr. J. N. Crouse, in person, will meet with us no more. But let it be recorded in living

letters that he died as he had always lived, with his face toward the sun, full of hope and confidence, courageous and brave. Yes, he died as only real men die, with his high ideals unlowered, with his courage undaunted; and, through his belief in the mercy of God, as though he confidently expected to reap his just reward in the life beyond the grave, in realms beyond the skies. May his soul rest in peace.

A musical selection entitled "The Sweetest Name," rendered by the quartet, followed by the benediction by the Rev. C. M. Filer, brought the exercises to a close.

DIED.

Dr. E. V. Shadomy at his home at 2079 Albion St., Denver, Colo., February 4, 1914. Age 46 years.

Dr. Shadomy was born at Queensville, Ind., on July 30, 1867, and was a graduate of the class of '02 of the Colorado College of Dental Surgery, as well as a member of its Faculty. He leaves a wife and one child.

The following resolutions were passed at the regular monthly meeting of the Board of Directors of the Colorado College of Dental Surgery, February 5, 1914.

Resolved, That we, the Board of Directors of the Colorado College of Dental Surgery, feeling deeply the loss we have sustained in the death of Dr. E. V. Shadomy, a graduate of this school and a member of its Faculty, do express our great sorrow; and be it further

Resolved, That this memorial be sent to the bereaved family and a copy spread upon the minutes of this Board and one sent to the dental journals for publication.

THE DENTAL REVIEW

Devoted to the Advancement of Dental Science,

PUBLISHED MONTHLY.

EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

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EDITORIAL.

THE FALLIBILITY OF THE X-RAY.

It is probably true that no other discovery in recent years has been of greater value to the medical and dental professions than has that of the X-ray. It has aided us in clearing up many obscure lesions and has thus been of immense value in diagnosis. In dentistry it has been of especial service in discovering impacted or delayed teeth in the jaws, and has shed light on many a puzzling case of neuralgia by showing the cause of the irritation. Although it is only a comparatively few years since its introduction it would leave us bereft of much of our usefulness if it were eliminated from our practice.

And yet with all this it has its limitations, and it is high time they were pointed out. It has been used extensively for diagnosing abscesses and bone lesions in the jaws, and for showing the condition of root fillings in teeth. It is useful for these purposes up to a certain point, but it is by no means infallible, and in some cases it is decidedly misleading. It may be that we have not yet advanced sufficiently in its use to correctly interpret its findings, but the fact is that when it comes to diagnosing bone absorptions and alveolar abscesses the most expert X-ray men we have are often very wide of the mark. Nor do we believe this can be relied on to tell accurately whether root canals are properly filled or not. Many a pulpless tooth has been arraigned as the culprit when the fault lay else-

where, and many an operator has been censured for poor root filling when his operation was not at fault. And the great danger is that medical men will be extensively misled about dental operations as interpreted by the X-ray. Already some of them are reading all sorts of disaster as the result of root filling. If a patient has a pain anywhere about the jaws they are making X-rays—which in itself is perfectly proper, and which in many instances will throw light on the trouble—but they are reading into these X-rays much evidence which is not compatible with fact. It does not follow that because a radiograph shows a lightened area around the end of a root that the bone is all absorbed at that point or that there is an abscess cavity there. It does not prove that a root canal is not well filled because the radiograph fails to show a filling to the apex. We must be more discriminating in reading radiographs than we have been in the past if we are to avoid doing harm to the patient.

A single instance, illustrative of many others which might be mentioned, will serve to prove the present contention: A patient had pain in the region of the left upper cuspid. This tooth was banded as the middle pier to a bridge. A radiograph was made of the region, and the verdict of the radiographer, who was an experienced operator, was that there was an extensive abscess cavity around the cuspid with the bone all absorbed. His remark was: "If you cut the band the cuspid will drop out. Nothing holds it in place but the gold band."

The band was cut and the cuspid was found perfectly firm—the thing that nearly dropped out was the bridge, the cuspid having been its chief support. Thinking from the evidence of the radiograph that there must at least be an abscess on the cuspid it was drilled into—only to find a live pulp. Here, with the best intentions, a wrong was done the patient on the evidence of the X-ray, and it is probably not an isolated case.

This article is not intended as a reflection on the great utility of the X-ray, which is cheerfully acknowledged, but merely to counsel caution on the part of those who invariably "see things" in every radiograph that is taken.

"EXPERIMENTAL EVIDENCE OF VARIATIONS IN ALIMENTARY SECRETIONS AND THEIR PATHOLOGICAL RESULTS."

Under this head Prof. H. P. Pickerill, of Otago, New Zealand, publishes in the January, 1914, number of the *Interstate Medical Journal* of St. Louis, Mo., a very instructive article dealing with his favorite theme "Salivary Secretion." In his "Cartwright Essay," published several years ago he pointed out the effect of various food materials on the salivary flow, and its relation to the incidence or inhibition of dental caries. He showed, contrary to all preconceived ideas, that acid fruits were inhibitory to caries, arguing that the salivary stimulation induced by them tended to bring about a condition of immunity.

He now goes further and, after a study of the action of various foods on the alimentary canal, he says: "I desire to show that *what is best for the mouth is best for the remainder of the alimentary tract*; that, in fact, the several digestive cavities are governed by identical or similar laws, and further, from the point of view of initiating and maintaining normal alimentary secretions and peristalsis, the mouth is *the most important part of the whole canal*." He further says: "It is important to recognize that salivary secretion is normally a reflex one, and that the normal stimulant to the flow is the food we eat, and, as I propose to show, differences in food produce enormous differences in the character of the juice secreted."

He then goes on to show the effects of various food materials on the functions of the alimentary tract, and recites experiments which prove the desirability of employing such foods as shall stimulate salivary secretion. The article should be read by dentists as well as by medical men.

THE EDITOR'S DESK.

A PICTURE AND A PREACHMENT.

The accompanying picture was sent me by Dr. C. H. Oakman, of Detroit, Michigan, and it is worth looking at the second time. It

shows a crippled girl taking her crippled brother and sister to the dental clinic. Three crippled children in one family is a pathetic thing in itself, but supposing there had been no dental clinic established in Detroit, and these children were suffering from defective and aching teeth. Presumably the two younger children were un-



Crippled girl taking her crippled brother and sister to the Dental Clinic, Detroit, Mich.

able to walk and had it not been for the improvised wagon and the loving kindness of the older sister it might have been difficult for them to get to the clinic. There is a lesson for all of us in this picture. It illustrates one phase of a great need in our large cities, and it shows on its face a condition well worth studying. There are no rubber tires on that wagon, but look at the children. They are clean, neat and evidently well cared for at home. They may be poor—they probably are—but there are many children of the poor who are

kept tidy, and who are worthy of all the legitimate aid the State can give them when it comes to the relief of bodily suffering. It is difficult enough for children who are well and normal to make their way up in the world to places of emolument and honor, it is doubly difficult when they are crippled in any way or handicapped by physical defects, and it is next to impossible for them to do it when they are constantly ground down by the suffering which comes from neglected mouths and decaying and abscessed teeth.

We are only just awaking to the duty we owe these poor children. And that duty does not stop at the mere relief of suffering—it should extend on into the education of the child as to the proper care of the mouth and teeth, to the end that much of the dental disease of the present day shall be prevented, and the people shall be taught to care for themselves instead of drifting along to ill health and then looking to the State or city to remedy it. As I view it our free dental clinics are more valuable in an educational way than they are even in the relief of suffering, and I do not look lightly upon the relief of suffering among the children.

Take children like these three in the picture and they will profit immeasurably by the right kind of advice and example. They will soon learn that good teeth and clean mouths go a long way toward establishing health, and when they once learn this lesson they will do their share in keeping their mouths clean and healthy. Here are three sweet faces, all alert, intelligent and hopeful. That boy may be President of the United States yet, even though today he is riding in an old varnish box. Those girls may grow up to lives of great usefulness, and contribute much to the welfare and happiness of the world, and I hope they will.

All honor to the men in Detroit who have established free dental clinics where such children can have service and not be doomed to add the suffering of toothache to their already heavy handicap. I thank Dr. Oakman for giving me the pleasure of seeing this picture and I am doubly pleased to be permitted to share it with my readers.

BOOK REVIEWS.

DENTAL DISEASES IN RELATION TO PUBLIC HEALTH, by J. Sim Wallace, D. Sc., M. D., L. D. S., formerly Dental Surgeon and Lecturer on Dental Surgery, London Hospital. 90 pages. Published by *The Dental Record*, London, 1914.

It is always a pleasure to review a book written by Sim Wallace. It is never stereotyped, never dull, and always thought-compelling. The present volume is made up of three papers read before associations, and here brought together in consecutive order. The author touches the subject at so many different angles that it is impossible to consider them all, but as an illustration of his forceful method of calling attention to the importance of his topic we quote the following on "The Prevalence and Seriousness of the Diseases of the Teeth." He says: "I should like here briefly to direct attention to the diseases of the teeth themselves, for it is sometimes overlooked that national and individual welfare depends to a certain extent on the excellence of the teeth, apart from the diseases resulting therefrom. In order to limit the figures we may direct attention to what exists in Great Britain, recognizing, however, that it is merely taken as an example among civilized nations. Let us say, for the sake of having round numbers, that the population is 40,000,000. We know from statistics taken in school children that there are on the average some six to nine teeth decayed or lost in each mouth. We know further, though caries is as a rule less rapid in adult life, that the number decayed or lost is much greater as age advances, so we come to calculate that there are between 250,000,000 and 500,000,000 teeth decayed or lost among the 40,000,000 inhabitants of these islands. If we estimate the value of a sound tooth as compared with a diseased one at £1 (and even in horses each diseased tooth depreciates a horse's value by more than that amount), we come to realize that the loss to the nation from carious teeth alone is represented by hundreds of millions of pounds."

That is a paragraph which is well calculated to rivet the attention of any chance reader to the importance of the subject, and the entire book is filled with argument which will well repay a careful study. We cordially commend it to our readers.

PRACTICAL HINTS.

Edited by J. E. Schaefer, D. D. S.

(This department is for busy readers. We want short articles containing practical hints—the shorter the better. No article must exceed 200 words, unless of exceptional merit. Every dentist has some useful hint that has been of value to him, and if he will only put it in print it may be of equal value to others. That is what this department is for. Due credit will be given for every article sent. Address J. E. Schaefer, 1745 W. Harrison St., Chicago, Ill.)

New Method of Devitalizing a Pulp:—Cut a piece of very elastic rubber tubing $\frac{3}{4}$ -in. long, remove needle from hypodermic syringe, and fit and tie lightly over end; with a No. $\frac{1}{2}$ burr puncture pulp, fit piece of tubing *tight* over tooth and draw plunger out. The blood will be rapidly drawn from the pulp without pain, when it can readily be removed.—*J. H. Williams, M. D., D. D. S., Jacksonville, Fla.*

Gutta Percha Fillings in Temporary Teeth:—When two cavities approximate each other the temporary teeth may be made comfortable by bridging across the interproximal space with gutta percha, providing a metal plate has been placed across the interproximal space, one end resting on the gingival wall of each cavity.

A bit of gutta percha is first placed on the under side of the metal plate to make a gutta percha adaptation, then the rest of the filling is to be placed upon it.—*J. F. Stephan, D. D. S., Cleveland, Ohio.*

Arsenic in Temporary Teeth:—I think it is a pretty safe rule to figure somewhat along this line; that the resorption of the root of a temporary tooth takes about three years. In other words, if the deciduous centrals are lost at seven, the resorption of the root starts at about four, and if you have to devitalize, it will not be well to use arsenic in that tooth in a child five or six years old, because at that time there is considerable resorption. If you have to devitalize a central incisor before the child is four years of age you are fairly safe in using arsenic. Take a second temporary molar usually lost, between 10 and 11, three years previous to that root resorption begins, a

child about six years of age, you are safe in using arsenic, but in a child of eight and a half or nine years of age I would not like to use it.—*G. W. Dittmar, D. D. S., Chicago.*

Abscesses in Deciduous Teeth:—In the treatment of abscesses in deciduous teeth it is never necessary to establish a sinus. If you have an abscess in a deciduous tooth, with pus oozing out of the gums freely upon the slightest pressure, if you seal in that tooth formocresol the pus will virtually dry up. It will disappear. I never intentionally establish a sinus in a deciduous molar tooth. After the canals are sterilized I never attempt to fill the root with any gutta percha points. I simply fill the root with a solution of gutta percha. The solution I use is known as eucapercha compound and as I force this solution into the pulp chamber and root canals with gutta percha, I let the eucapercha, if it wants to, flow right out from the canals through the sinus. Before that time I never made any special attempt to establish a sinus in a tooth I wanted to save for three or four years.—*J. P. Buckley, D. D. S., Chicago, Ill.*

Extraction of Broken Down Inferior Third Molars:—When the crown of the third molar is broken down so that the forcep cannot be used because the mandible broadens out buccally at the angle where third molar erupts, and the forcep cannot be forced down onto the roots, use an elevator flat on one side and convex on the other. The flat side is used against the third molar, provided that the second molar is sound and not all filling, so it can be used as a fulcrum, force the elevator in from the buccal side and turn distally, forcing the elevator down with each turn. By so doing you force the tooth in a distal direction and as normal roots always curve in that direction, you will release it much better and very little laceration to the surrounding tissue will be found after the operation. However, should the first molar be missing do not use elevator unless space has been wedged with a piece of wood or compound forced in and hardened.—*A. Brom Allen, D. D. S., Chicago, Ill.*

Retaining Upper Dentures:—The theory of the retention of upper dentures without vacuum cavities is as follows:

The center of the palatal arch is hard in ninety-seven per cent of mouths, and is the only portion of the jaw that never changes. Whereas the alveolar ridge changes, especially under vulcanite in 80 per cent of mouths; under metal to some extent. Unless provision is made for this change, it is but a question of time when the plate is not resting on its proper place, but is on the palate, and rocking. If there is an air chamber the anterior and posterior margins are resting hard and rocking. The remedy is placing a "relief" of base plate wax over the whole *hard* surface from near top of the ridge to the posterior border, the edges flush with the model. The plate, of course, must extend beyond to exclude the air. In the vulcanite plate scrape the impression, although scraping is an uncertain process. In preparing a mouth for artificial teeth, a good rule to follow at the extraction of certain teeth is this: whatever will make the denture the most useful by all means extract.—*L. P. Haskell, D. D. S., Chicago, Ill.*

Tube Sprue:—This sprue is devised in the form of a tube. In using a sprue we must at present heat it in order to place it in the wax successfully, and hold it still until the wax cools off, and becomes hardened which increases the liability to damage the margin of the wax. This difficulty is entirely done away with by the sprue being hollow and thin. The heat is more easily eliminated and it does not require as much time as those which have been used heretofore. In fact it cools off almost instantly as the tube sprue is placed in the wax and the wax hardens immediately. This enables the operator to carry on the work without any fear of damaging the margins of the wax. Because of its being hollow the wax ascends along the lumen of the tube sprue by its capillary attraction and the sprue is placed more firmly in the wax. Another advantage of this sprue is that, when the flask is heated and the wax is melted it bubbles out through the lumen of the tube sprue acting as a signal for removing the sprue. Furthermore there is no danger of the wax invading the investment materials even when removal is delayed, as it escapes through the lumen of the tube sprue.—*T. Itatani, Senior Student Chicago College of Dental Surgery.*

Wassermann Reaction:—In view of the fact that whole volumes have been devoted to the Wassermann reaction, any attempt to describe it in the brief space of this paper would be useless, particularly as the actual performance of the test consumes too much time to bring it within the province of the busy practitioner. It consists in the detection in the patient's blood of certain substances produced by the action of the syphilitic virus. It is of more practical importance to you to know how to collect the blood for the test, and the interpretation of the results obtained. To obtain the blood, the patient's middle finger is first wiped off with alcohol, and the pulp of the distal end of the finger toward the ulnar side is given a deep puncture with a sharp pointed lance. This as a rule causes little or no inconvenience. About two cubic centimeters of blood should be collected in a small sterile test tube, and can usually be obtained in a minute or two by having the patient's arm hanging down and squeezing the finger after the manner of milking a cow. When the blood is obtained, the tube should be sealed with a cork not with cotton, and put in a cool place, preferably on ice, until the test is made. Ordinarily the blood will keep in good condition for three or four days. In the past two years, in association with Dr. B. A. Thomas, at the Philadelphia Polyclinic, I have done over 2,000 Wasserman reactions, with approximately the following results in cases clinically diagnosed as syphilis:

Primary syphilis—40 per cent. positive.

Secondary syphilis—96 per cent. positive.

Tertiary syphilis—80 per cent. positive.

—Robert H. Ivy, M. D., D. D. S., Philadelphia.

New Method for Using Steele Facings:—Take a strip of 31 gauge gold of the width desired, anneal, then with a pair of round nosed pliers fold it together in the center, compressing it tightly: *Fig. 1*. Slip it into slot of facing, remove and with file cut notch sufficient for the extension in incisal end of facing. Replace in facing and cut off leaving ends projecting about one millimeter. With knife blade spread these ends while still in facing. *Fig. 2*. Moisten facing and with inlay wax make dummy the shape you desire for finished case. To make backing extend past end of facing for incisal protection slip the facing down slightly and press the

wax against it, slip back to place and trim to proper shape, attach sprue wire and cast. (Graphophone needles make the best sprue wires.)



Fig. 1.



Fig. 2.

Where more than one dummy is used in bridge, set up the wax dummies on articulator as you wish case to be when finished and attach together with warm spatula, remove facings attach sprue and cast the whole bridge, excepting the crowns, at one operation. To make bicuspid or molar dummies I use a depressed cusp die plate. Moistern or oil the cusp desired, place excess of wax on facing, press into cusp, remove and trim to desired shape. Any number of the wax dummies can be cast at one time. (I have cast five.) Where the bridge is too long to cast in common casting ring, take a strip of wax such as artificial teeth come on, form into a ring, warm the casting ring and stick the wax ring to it, you thus make the casting ring of sufficient depth for any bridge. I use coin gold in casting bridges as it is harder and stronger than 22 K. All clippings can be used in casting the dummies so no gold is wasted. In this method you get a solid gold dummy or bridge, the only solder used being that necessary to attach the bridge to the anchorage. You can cast a whole bridge in less time than you can back up and solder the backings furnished and at a cost not greater than the backings alone, thus saving the entire amount of solder now used in the bridge. I have used this method for nearly two and one-half years and consider it to make the best and strongest bridge with the least work and expense of any method now in use. Try it.—*R. E. Rose, Emmett, Idaho.*

MEMORANDA.

[Society notices will be given insertion in this department free of charge. Subsequent insertions will be charged for at the rate of \$2.00 an inch.]

SOUTH DAKOTA STATE DENTAL SOCIETY.

The regular annual meeting of the South Dakota Dental Society will be held at Sioux Falls, May 12 & 13, 1914. O. W. HANSON, Sec.

THE AMERICAN DENTAL SOCIETY OF EUROPE.

The forty-first annual meeting of the American Dental Society of Europe will be held in Paris, France, July 30, 31, August 1, at the Hotel Continental. All members of the profession are cordially invited to be present. G. B. HAYES, Secretary.

BANQUET TO DR. A. O. HUNT.

About 200 dentists met in Omaha, Neb., on February 23 to do honor to Dr. A. O. Hunt at a testimonial banquet. Judging from the newspaper accounts the event was in every way a success, and reflected the high regard in which Dr. Hunt is held by the profession of the great Middle West.

MISSOURI STATE DENTAL ASSOCIATION.

The forty-eighth annual meeting of the Missouri State Dental Association will be held in the Planters Hotel, St. Louis, April 21-22, 1914, to which all ethical members of the profession are invited. A program of unusual interest has been provided including four illustrated papers by eminent dentists from outside the State. S. C. A. RUBY, Sec., Mo. State Dental Association.

TEXAS STATE BOARD OF DENTAL EXAMINERS.

The next regular meeting of the Texas State Board of Dental Examiners, for examination of applicants for certificate to practice Dentistry in the State of Texas, will be held in Dallas, Texas, June 22, 1914, at the high school building, beginning at 9:00 A. M. No diplomas recognized, no interchange of licenses with other States. All applications, accompanied by the fee of \$25.00, should be in the hands of the Secretary not later than June 17. For further information, address, C. M. McCAULEY, Sec'y., Abilene, Texas.

IOWA STATE DENTAL SOCIETY.

The fifty-second annual meeting of the Iowa State Dental Society will convene at Des Moines, Iowa, May 5, 6 & 7, 1914, beginning Tuesday, May 5, at 9:00 A. M. Elaborate clinics and lectures and a large exhibit will be presented. Further information will be furnished upon request from ethical practitioners of other states contemplating a visit to the meeting and to whom we extend a cordial invitation. Exhibitors desiring space should apply to Dr. W. J. Cameron, Des Moines, Iowa. C. M. KENNEDY, Sec'y., Des Moines, Iowa.

NATIONAL DENTAL ASSOCIATION.

The 1914 session of the National Dental Association will be held in Rochester, N. Y., July 7 to 10, 1914. The Local Committee has selected the Powers Hotel as headquarters and have made the other necessary arrange-

ments for a large attendance. This is the first meeting of the Association under the reorganization and the House of Delegates, the governing body, will meet at 10:30 A. M., July 6. The officers and committees are expecting to present an exceptionally interesting program, the details of which, together with the other arrangements, will appear in the later Journals and the next number of our Official Bulletin. HOMER C. BROWN, President, Columbus, Ohio, OTTO U. KING, General Secretary, Huntington, Indiana.

MICHIGAN LICENTIATES PLEASE NOTICE.

In compliance with Section 5 of Public Act No. 183 of 1913, which is as follows: "Every registered dentist shall, on or before the first day of May of each year, except the one in which he is registered, pay to the secretary of the board of dental examiners, a license fee of one dollar. The year for which a fee shall be paid shall begin on the October first, following the May when it becomes due, and end the succeeding September thirtieth. In case any person defaults in paying said fee, his license may be revoked by the said board of dental examiners, on thirty days' notice in writing from the secretary, unless within said time said fee is paid." Notices will be mailed to all dentists registered in the State of Michigan, to their last known address, on or before April fifteenth, 1914. Failure to receive such notice will not be an exemption or an excuse for non-payment. In such cases all persons should notify the secretary, giving their correct address. This also applies to all those living outside the State. F. E. SHARP, Sec'y., Port Huron, Michigan.

ASSOCIATION OF MILITARY DENTAL SURGEONS.

On January 24, 1914, at a meeting held at the Army and Navy Club, New York City, the Association of Military Dental Surgeons of the United States was organized, the membership in which is open to Dental Surgeons, Acting Dental Surgeons of the United States Army and Ex-Dental Surgeons.

The officers chosen to serve until the Rochester meeting (at which time a new election will be held), are:

President, Wm. C. Fisher; Vice President, John D. Milliken, San Francisco; Treasurer, Ralph W. Waddell, New York; Secretary pro tem, Wm. C. Fisher, 373 5th Ave., New York City.

Advisory Council Ex-Dental Surgeons: O. M. Sorber, Updyke & Foster, Chas. D. Long, E. J. Craig, Samuel Hussey, H. C. Rietz, John S. Marshall, Wm. Ware.

The object of this organization is to foster a higher esprit de corps, encourage the interest of the Dental Profession at large in the personnel of the Dental Corps and to collect for the Dental Profession such data and information pertinent to the practice of Dentistry in the Military World, as may from time to time be deemed worthy of presentation.

Permanent organization will be effected at Rochester, New York, the afternoon of the first day of the meeting of the National Dental Association, July seventh.

NEW JERSEY STATE BOARD OF DENTAL EXAMINERS.

The New Jersey State Board of Dental Examiners will hold their regular meeting and examination in the Assembly Chamber of the State House, Trenton, N. J., on June 29, 30, and July 1, 1914. License fee, \$25.00. No interchange of license. Applications must be filed *complete* with the Secretary at least ten days before date set for examination.

All applicants for a license to practice dentistry in New Jersey "shall present to said Board a certificate from the Superintendent of Pub-

lic Instruction showing that before entering a dental college, he or she had obtained an academic education consisting of a four years' course of study in an approved public or private high school, or the equivalent thereof." Therefore, the Secretary will issue application blanks to applicants *only* upon the presentation of the required dental certificate from the Superintendent of Public Instruction, Trenton, N. J.

A bridge, consisting of three or more teeth exclusive of abutments, and one Richmond Crown (metal gold), will be required mounted and articulated as a practical test in Prosthetic Dentistry, in place of a full set of teeth soldered upon a gold or coin silver plate hitherto required.

For further particulars, apply to ALPHONSO IRWIN, D. D. S., Sec'y., 425 Cooper street, Camden, N. J.

RECENT PATENTS OF INTEREST TO DENTISTS.

- 1,072,432, Dental appliances, E. M. Crane, Detroit, Mich.
- 1,072,517, Crown pin extractor, F. H. Skinner, Chicago, Ill.
- 1,072,518, Dental instrument, F. H. Skinner Chicago Ill.
- 1,072,519, Dental appliance, F. H. Skinner, Chicago, Ill.
- 1,072,520, Double acting pin puller, F. H. Skinner Chicago Ill.
- 1,072,521, Pin puller, F. H. Skinner, Chicago, Ill.
- 1,073,893, Handle for dental impression trays, etc. L. E. Eaton, Sturgis, S. D.
- 1,073,995, Attachment for dental pluggers, F. C. Lambert, New York, N. Y.
- 1,073,725, Tooth powder, R. Yeganian, Yonkers, N. Y.
- 1,074,345, Artificial denture, E. C. Bennett, New York, N. Y.
- 1,074,169, Antiseptic tooth brush receptacle, E. Fowler, Seattle, Wash.
- 13,621, (Reissue)? Dental instrument, J. L. Kelley, Chicago, Ill.
- 1,070,106, Ingot mold, W. R. Rossinger, Marion, Ohio.
- 1,069,680, Tooth, H. E. Dowell, Newport, Ark.
- 1,070,123, Dental instrument, W. W. Evans, Hamilton, Va.
- 1,069,874, Dental tape or floss, F. Z. Hanscom, Chicago, Ill.
- 1,070,132, Producing backings for artificial teeth, G. Holtz, Gouldsboro, Pa.
- 1,070,188, Wrist joint for dental engines, A. W. Schram, Riverton, N. J.
- 1,070,219, Artificial tooth, A. W. Wimmer, Chicago, Ill.
- 1,069,616, Dental vulcanizer, A. C. Hulbert, Santa Rosa, Cal.
- 1,070,785, Artificial tooth, T. E. Dimelow, Philadelphia, Pa.
- 1,070,442, Artificial teeth, E. Fogg, Newcastle-upon-Tyne, England.
- 1,070,494, Detachable tooth facing for bridge and plate work, W. C. Lampe, Pittsburgh, Pa.
- 1,070,500, Dental casting apparatus, D. S. Mackenzie, Levin, New Zealand.
- 1,070,905, Dental plate waxer, V. McRae, Minneapolis, Minn.
- 1,070,858, Tooth brush holder and sterilizer, J. H. Trayne, Groton, Mass.
- 1,072,357, Dental device, C. J. Palmer, Appleton, Wis.
- 1,071,952, Artificial tooth, L. Perzin, Philadelphia, Pa.
- 1,071,966, Tooth brush holder, H. W. Sorensen, U. S. Navy.
- 1,071,019, Artificial denture, C. P. Balger, Cincinnati, Ohio.
- 1,071,395, Dental engine, W. E. Clayton, Los Angeles, Cal.
- 1,071,228, Mandrel for dental disks, P. Gross, Dusseldorf, Germany.
- 1,071,175, Flask, W. C. Poppe, Chicago Ill.
- 1,071,106, Dental instrument, F. H. Skinner, Chicago, Ill.
- 1,073,365, Artificial tooth, H. Rutland, York, Pa.

Copies of above patents may be secured for fifteen cents each, by addressing John A. Saul, Solicitor of Patents, Fendall Building, Washington, D. C.

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ETIOLOGY, DIAGNOSIS AND TREATMENT OF ACUTE AND CHRONIC ALVEOLAR ABSCESS.*

BY THOMAS L. GILMER, M. D., D. D. S., SC. D., CHICAGO, ILLINOIS.

The literature of alveolar abscess is voluminous, but there are only two writings on the subject which may be considered classics, and neither of these are recent writings. One is by Judd, published in the *Missouri Dental Journal* in 1869; the other by Black in the *American System of Dentistry* in 1887.

That we may study the subject as broadly as possible we should include certain clinical manifestations which simulate alveolar abscess, but which are wholly dissimilar in focal origin and pathogenesis. These manifestations should be mentioned if for no other reason than for the purpose of differentiation.

Strictly speaking, the term abscess means a collection of pus in a cavity formed within some tissue or organ of the body as a result of suppuration. Alveolar abscess in its variations differs from abscesses in other parts of the body mainly in locality and in the kind of tissues involved.

To many, alveolar abscess means an acute or chronic infection in the apical space of a tooth's root, due to the presence of pyogenic and other bacteria and their poisons, which have passed from the tooth's pulp chamber and root canals into the apical space through the apical foramen, causing pus formation. This definition, while in the main correct, is too narrow for a comprehensive scientific understanding of the entire subject. It might be accepted to represent the conventional alveolar abscess, and for convenience we will designate this kind of abscess as *typical* alveolar abscess.

*Read before the Chicago Dental Society, February 17, 1914.

It is by no means true that all abscesses originating in the peridental membrane are due to poisons and bacteria which have found exit from the pulp chamber and root canals. Take, for instance, the lateral abscess of Black, and other acute infections due to pyorrhea alveolaris; abscess due to impacted teeth, actinomycosis and other forms of abscess in and about the alveolar process which are in no wise dependent upon pulp canal infection. These forms of abscess may be classified as *atypical* alveolar abscess.

The structural elements of the peridental membrane are composed of "white connective tissue fibers; fibroblasts; cementoblasts; osteoblasts; osteoclasts; epithelial structures, which have sometimes been called glands of the peridental membrane; blood vessels and nerves." (Noyes). These structural elements are practically the same in all parts of the membrane covering the root, but vary in some degree in their relative proportions in its different parts. For instance, in the apical third of the membrane we find fewer epithelial elements, a richer nerve and blood supply, and there is greater thickness in proportion to the diameter of the root than in the other two-thirds of the membrane. It is the apical third of the peridental membrane in which we are most interested, in the discussion of this subject, since it is here that the inflammatory process begins in typical alveolar abscess.

The delicate structural elements before enumerated are encased in bony walls, and when these elements become subject to inflammatory processes, opportunity for resistance is less favorable than other somewhat similar tissues with more favorable environment.

Congestion in these narrow walls from increase in the blood supply and inflammatory exudates tends to promote stasis. Opportunity for the blood elements to overflow into neighboring parts is restrained by the bony encasement. Pain, therefore, is generally manifest with such environment if the peridental membrane becomes inflamed. Pain is due, when present, to pressure on the sensory nerves and to the poisons which act as irritants to these nerves.

It does not necessarily follow that abscess formation must be an inevitable sequence to the condition just described. It may be that pyogenic bacteria are not present, or the patient for the time may be comparatively immune to pus organisms, or they may not

be present in sufficient number, or may be lacking in virulence. If either of these conditions obtain, the inflamed area may be restored to health by resolution. The train of symptoms accompanying these conditions are not, except in degree, very dissimilar to those which precede pus formation in alveolar abscess, and the treatment, abortive, should be the same.

The source of pyogenic organisms which have reached the apical space and cause purulent infection is always interesting. It is probable that the organisms may reach the inflamed area from the mouth, through the root canals, but that they do come from another source cannot be doubted, since there are infections in the apical space of teeth which have no cavities of decay. The theory that pyogenic bacteria pass through teeth having no cavities of decay can hardly be entertained. That live pyogenic bacteria are sometimes conveyed to inflamed areas by leucocytes is an entirely reasonable hypothesis. That they may be carried in the blood in an embolus to such an area, or through the lymph channels, or float in the blood streams, independent of the leucocytes, may also be true. Most individuals, at times, have in some part of the mouth and jaws a small unnoticed focus of infection, and the leucocytes may envelope bacteria from such a focus, and before they are destroyed they may be conveyed to the injured tissues in the apical space, and finding favorable soil for their growth where they may, if the phagocytic activity of the leucocytes be insufficient to destroy them, escape and multiply.

If the injury resulting from putrefactive pulp cavity poisons be great, and the ingress of pyogenic organisms be sufficient in number and virulence, then, unless the patient is immune, an acute alveolar abscess may be established. If, on the other hand, the passage of saprophytic poisons from the root canal into the apical space is inconsiderable, the dosage of pyogenic bacteria small and the resistance of the patient for the invading bacteria high, there may be destruction or inhibition of the pus bacteria with return to health. On the other hand, an infection which runs a mild, almost imperceptible course, may result in a blind abscess with far-reaching disastrous effects.

The symptomatology of abscesses about the jaws is not always easily clear, and diagnosis is made more difficult from the

fact that there are infections in the tissues about the jaws which are not alveolar abscess, but which present some of their clinical features. Such infections are by no means dependent upon or connected with the jaws or teeth. To illustrate, I may recite two cases which very recently came under my observation, both of which gave most of the symptoms of alveolar abscess and had thus been diagnosed, but which I was able to demonstrate were in no way connected with the teeth or jaw. The first patient was a woman forty years of age. There was extensive swelling under the mandible near the angle, which extended forward and up on the cheek. There was slight trismus, which prevented complete opening of the jaws, temperature 102° , there was much pain and general discomfort. On examining the teeth I found all of the pulps alive on this side of the mouth. The third molar had been removed fifteen years before, therefore infection from an impacted tooth was excluded. There was no indication of a lesion in any part of the mouth or on the face. The tonsils were normal and no previous history of tonsillitis or cervical or submaxillary lymph-adenitis could be elicited. Owing to the swelling, it was difficult to palpate the submaxillary salivary gland. No stone was found in Wharton's duct, but the tube was enlarged and hard. Pressure upon the submaxillary gland and stripping of Wharton's duct caused pus to flow from the duct. Here was the secret of the clinical manifestations. It was an infection of the submaxillary gland which had caused the condition and gave some of the symptoms of acute alveolar abscess.

The other case was a boy fourteen years of age. He was assigned to my service in St. Luke's Hospital after diagnosis of alveolar abscess had been made. On examination of the patient I found a large, red, shiny swelling extending from the neck up to near the malar bone, from back of the angle of the mandible forward to the region of the first lower bicuspid. There was slight pain, temperature 100° . Blood showed 14,000 leucocytes. Owing to the great swelling I was unable to palpate any of the glands under the jaw or in the cervical region. Wharton's duct appeared normal. The history elicited the information that the swelling came on rather slowly; ten days had elapsed since it had first been noticed. There was considerable trismus, but the jaw could be sufficiently opened to make a careful examination of the mouth and teeth. All

of the permanent teeth were in place, except the third molars. Those erupted were sound and none of them were sore to touch. The teeth were cleaner than is usually found in the mouth of such a child. The pulps in the teeth all responded to the faradic current test, excluding the teeth as a causative factor. The tonsils were enlarged, red and somewhat ragged. The child said that he had often had sore throat, that twice before he had a slight swelling under the mandible and that preceding this attack, and also preceding the previous attack, he had felt "kernels" (enlarged lymph nodes) under the jaw. Diagnosis, suppurative lymph-adenitis secondary to tonsillar infection. On palpation I thought I was able to make out very deeply in the tissues a slight fluctuation. I incised the skin and made blunt dissection, liberating a considerable quantity of creamy pus.

These two most recent cases are selected from many similar ones which simulated alveolar abscess, and are here given for the purpose of differentiation. Too often teeth with live pulps are drilled into in such cases when the Faradic current, as recommended by Prinz, might demonstrate the life of the pulp and the drilled teeth saved from mutilation. In rare instances, however, response to thermic or Faradic tests may give indication that the pulp is not the cause of the condition when it is. Reference is had to those cases in which pulpal tissue is dead in one canal and alive in the others.

The cardinal symptoms of alveolar abscess are those of inflammation enumerated by Celsus long ago. They are redness, swelling, heat and pain. To these there has since been added disordered function.

The periodontal membrane in its apical third is vascular and highly organized, as before indicated, therefore is more subject to injury and has less recuperative power than tissues less specialized. The symptoms of inflammation are also more quickly expressed in highly vascular tissue than those less vascular. This being true, we would expect expression of the symptoms of morbid changes in the apical space very early after injury, of whatever nature; however, there are exceptions to this rule, as an infection may exist, but give no objective symptoms which the patient recognizes. In the more acute forms of typical alveolar abscess the symptoms are positive in the early stages of the infection.

That we may observe the first objective symptoms of alveolar abscess we must recognize some steps in the progress which may be designated as the initial period leading up to abscess formation. As the immediate cause of an abscess we recognize pyogenic bacteria, but back of the advent of these organisms we must recognize in the symptoms a condition which is the immediate precursor of the process. This condition generally gives symptoms which the patient recognizes, and since it is one of the legitimate antecedents of abscess formation, the symptoms should be recognized as a part of the symptomatology of alveolar abscess. Reference is had to the action of poisons formed by putrefactive bacteria in dead tissue in the pulp chamber and root canals, which have passed through the apical foramen into the apical space.

No attempt will be made to discuss putrefactive processes which take place in pulp canals, or the nature of the poisons formed as a result of the process, but we must recognize the powerful influence these poisons exert on the periapical tissues and the consequent symptoms expressed as a result. The prominence of the objective symptoms expressed as a result of the passage of putrefactive poisons from root canals depends upon the quantity and nature of the poisons, and to another important factor, the presence or non-presence in the periapical space of pus-producing organisms. Early and exalted symptoms are usually manifest if in addition to the putrefactive poisons virulent pyogenic bacteria are present in the apical space at the same time.

The symptoms following the exposure of the periapical tissues to poisons formed alone by putrefactive bacteria, though less marked, are not materially different from those accompanying the first stages of inflammation due to pyogenic bacteria. There is slight soreness of the tooth to percussion, the swelling of the periapical tissues may cause the tooth to be pushed slightly out of its socket, giving the impression to the patient of its elongation, and the tooth may become somewhat loosened. It is to be doubted if there is ever sufficient putrefactive poison formed in the root of a tooth at any one time to cause systematic expression of sapremia. There is often a sense of fullness in the jaw about the affected tooth, from the passage of putrefactive poisons, and there may be throbbing, indicating congestion, which follows the advent of the poisons. Unless

pyogenic infection is a sequel or coexistent, then the symptoms generally quickly subside, and the tooth remains quiescent until there is repetition of the putrefactive process, when the same symptoms again recur. If these processes occur at frequent intervals, so frequent as to prevent complete restoration of the tissues to health before another excursion of the poisons from the root canal, then even in the absence of pyogenic bacteria, destruction of apical tissue will result, and with this destruction there will be involvement of the bone in a non-suppurative inflammation, causing limited destruction of the alveolar process. Such a condition gives serous exudates, which may be observed when the canals of the tooth are opened. Over-medication of root canals, or highly caustic antiseptics, may produce similar conditions.

Similar bone involvement with serous exudates may follow acute typical alveolar abscess which has become chronic. In such cases the serous exudate may be contaminated with pus and is known as sero-purulent discharge. The serous exudate which flows out through the root canal from bone cavities must not be mistaken for the cystic fluid which comes from epithelial lined cysts, quite commonly found in the jaws about the roots of infected teeth. The fluid from bone cavities with no epithelial lining is clear and is not viscid, while epithelial cyst fluid is usually of a light straw color and is more or less viscid.

The symptoms of acute typical alveolar abscess vary in intensity in different individuals, and in the same individual, at different times. This may be due to the kind or kinds of bacteria involved in the infection, to the virulence of the bacteria, and to the tissue resistive mechanism being lower at one period than at another. In some cases there is great pain early in the infection, much swelling, high leucocyte count, much pus formation, with great febrile exacerbation ranging from 103° to 105° , and the mouth may be very fetid. In others there is little pain, swelling slight, little or no increase in the leucocytes, little pus, and but slight temperature rise, perhaps 99° or 100° , or there may be no objective symptoms whatever. Any given case may vary between these extremes.

The early symptoms of acute typical alveolar abscess, as before said, are similar to those following the passage of saprophytic poisons from the root canal, namely sense of fullness, soreness of tooth to

percussion, slight pain, which may be temporarily relieved by pressure on the tooth, the tooth apparently elongated by swelling of the peridental membrane; but most of these symptoms instead of decreasing rather promptly increase. The pain is more intense and of a throbbing nature, there is greater protrusion of the root from its socket, the patient is able to definitely locate the seat of the disease, which is not always possible in a pulpitis, since the pulp has not the sense of touch, while the peridental membrane is thus highly endowed. (Black). On passing the finger over the inflamed area at this period a slight thickening of the soft tissues is observed and pulsation may be felt. The gum overlying the root is seen to be hyperemic. As the disease progresses the pain becomes more intense. Up to this period there is little rise in temperature, since increased temperature is principally due to systemic participation, resulting from absorption of toxins from the focus of infection. With these systemic symptoms leucocytosis is established in a greater or less degree. However, as Adami says, "Some little time is necessary before the bacteria, growing, are able to discharge sufficient toxins, and for these toxins to diffuse in sufficient concentration to attract the leucocytes out of the surrounding capillaries." With the rise in temperature there is often a period of chilliness. This chill condition is a nervous phenomenon. The surface of the body, though palid, is not cold to the touch, the thermometer indicating a decided rise in temperature. The pallor of the skin is due to temporary superficial arterial contraction.

As the infection increases pyogenic bacteria cause liquefaction of the adjacent tissue and pus is formed. There is rapid destruction of a considerable area of bone, giving a circumscribed abscess. The pus when formed in sufficient quantities burrows, going in the direction offering the least resistance. When the pus has passed from the periapical space through the bone and reaches the periosteum, the swelling of the overlying soft tissues rapidly increases and extends in all directions and the inflammation becomes more diffused. After the pus has penetrated the periosteum the pain usually subsides, provided the action has been rapid, but the fever and general discomfort of the patient continues. There is enlargement of the lymph nodes which drain the area, with more or less edema. The latter is especially great in the loose aveola tissue under the eye, when the abscess is in the region of six anterior teeth.

The nature of the swelling varies with the agents causing the infection. If the incubation period is slow and the swelling less rapid and is hard or brawny, we should expect that the pus will be less in quantity and slower in pointing, with more pronounced and graver systemic and local manifestations, except fever, which usually is not so high. This difference in clinical manifestation may, I believe, be attributed to the kind of organisms causing the infection, and in some cases to symbiosis. In streptococcus infections, especially in the region of the angle of the mandible, the swelling when it invades the floor of the mouth may cause the so-called Ludwig's angina and edema of the glottis with grave prognosis.

When the pus reaches the periosteum this membrane occasionally seemingly resists its passage through it, and one of two conditions may result. If the inflammation is very active there is, as Black says, a ripping up of the periosteum from the bone forming a sub-periosteal abscess with burrowing of the pus in all directions, causing, unless early avoided by surgical means, necrosis of bone in greater or less degree. In such cases the pus may appear about the neck of the tooth involved and sometimes about the necks of those nearby. If the inflammation is less active and the pus does not penetrate the periosteum, then there may be, instead of the foregoing, a circumscribed bulging of the periosteum over the root of the affected tooth. This condition may become chronic and remain indefinitely, or until surgical interference is resorted to for its cure. Whether the periosteum in some instances really offers greater resistance to the passage of pus, or whether it is more easily elevated from the bone in some patients than in others is not known. I incline to the latter opinion, since I have found in operations on jaws that the periosteum is much less tenaciously attached to the bone in some persons than in others, indeed in some instances it offers almost no resistance to the periosteotome, while in others it may be separated from the bone with difficulty.

We find in some neglected cases of this kind that the pus follows around between the periosteum and bone under the mandible and points lingually posterior to the third molar, and in rare instances it may burrow farther back and result in a retro-pharyngeal abscess. This result may also obtain when an abscess burrows

through the bone lingually on the posterior portion of the mandible. Occasionally an abscess points on the posterior portion of the hard palate on the upper jaw. An aneurism of the descending palatine artery has occasionally been mistaken for an abscess in this locality and incised with mortifying results. Pus originating in the maxilla may burrow upward and be discharged in the malar region. In one case seen at my clinic the pus first pointed near the inner canthus of the eye on the side of the nose. Occasionally we see an abscess of the mandible in which the pus, after having passed through the periosteum and having reached the fascia of the platysma myoides muscle, burrows beneath it down to the clavicle. Pus not infrequently reaches the nasal fossa from an abscess in the incisor region. Pus discharging through the natural opening of the maxillary sinus into the nose, while by no means a positive indication of alveolar abscess, may be a symptom of such an abscess, as the buccal roots of the first and second molars often approximate the floor of the antrum of Highmore very closely, and when abscesses occur about roots so situated, they not infrequently discharge pus into this sinus and thence into the nose. The jaws of syphilitics seem to be more disastrously affected by abscesses than non-luetics: necrosis is not an unusual sequel.

To infer that alveolar abscess is always due to some one species of bacteria is fallacious. That the staphylococcus albus and aureus are the principal organisms causing alveolar abscess does not agree with some recent investigations made for me. To determine this subject I submitted to Dr. Moody, bacteriologist at St. Luke's Hospital, a number of specimens of pus from acute abscesses collected in the most careful manner, that they might not be contaminated by the oral or other flora. His report is here given.

He says, "The pus removed from fourteen cases of jaw abscesses, with two exceptions, was examined in the following routine way. Slants of blood agar and ascites dextrose agar were smeared with the suspected material. One-half of the slants thus inoculated were placed under anaerobic conditions by the addition of pyrogallic acid and sodium hydroxide to the tubes after the cotton plugs had been pushed in about one-third distance from the top. The tubes were then plugged with a plain cork and sealed with paraffin. All cultures were then placed in the incubator at

37 C. where they remained for twenty-four hours to forty-eight hours.

The tubes under anaerobic conditions were not opened for forty-eight hours after inoculation. At the end of that time smears were made on glass slides and stained in the usual way for the microscopical identification of the organisms.

From this short series of fourteen cases streptococcus pyogenes and bacillus fusiformis were the predominating organisms. The finding of an occasional staphylococcus pyogenes albus colony, or that of the micrococcus catarrhalis we believe to be accidental contaminations. Of these cases streptococcus pyogenes was found in pure cultures in five cases. It was also present associated with *B. fusiformis* in eight cases. *B. fusiformis* was found in only one case in which no streptococci were found. In two of the cases *B. fusiformis* was isolated in almost pure culture, there being associated only a few colonies of streptococci. Anaerobic cultures were not made in two cases in which streptococci were the only organisms isolated.

Our conclusion must then be that in this series the predominating organism is a hemolytic streptococcus. In the majority of cases *B. fusiformis* is associated with it and often may occur as the prime causative factor in those conditions."

TABLE OF RESULTS OF CULTURES.

Cases.	Aerobic.	Anaerobic.	Diagnosis.	Remarks.
No. 1.	Strep. pyogenes..	No cultures made.	Acute Alveolar Abscess.....	Ordinary acute type.
No. 2.	Strep. pyogenes..	No cultures made.	Acute Alveolar Abscess.....	Ordinary acute type.
No. 3.	Staph. pyog..... albus		Acute Alveolar Abscess.....	Abscess of upper first molar, much edema. Pus discharged into maxillary sinus.
No. 4.	Mic. Catarrhalis..	<i>B. fusiformis</i>	Acute Alveolar Abscess.....	Ordinary acute type.
No. 5.	Strep. pyogenes..	None	Acute Alveolar Abscess.....	Ordinary acute type.
No. 6.	Strep. pyogenes..	None	Acute Alveolar Abscess.....	Ordinary acute type.
No. 7.	Strep. pyogenes..	Strep. pyogenes..	Acute Alveolar Abscess.....	Ordinary acute type.
No. 8.	None.....	<i>B. fusiformis</i> <i>B. pseudo</i> diphtheriae	Acute Alveolar Abscess.....	Ordinary acute type. Left upper lateral incisor. Pus evacuated through root canal second day after initial symptom.
No. 9.	None.....	Strep. pyogenes.. <i>B. fusiformis</i> Strep. pyogenes..	Acute Alveolar Abscess.....	Ordinary acute type.
No. 10.	Strep. pyogenes.. Staph. pyogenes.. albus (few).....	Strep. pyogenes.. <i>B. fusiformis</i>	Acute Alveolar Abscess.....	Much swelling. Several ineffectual attempts made to void pus in the mouth. External incision discovered much fetid pus.

No. 11.	Strep. pyogenes.	Strep. pyogenes.	Acute Alveolar	Hard brawny swelling. Sev-
			Abscess.....	weeks' standing. Pulse vary-
				ing from 60 to 100, temp.
				101.6°. External incision
				found small quantity of pus.
				Slow recovery. Two weeks
				after recovery submaxillary
				gland on opposite side be-
				came involved in similar in-
				fection. Hot boric solution
				applied in acute stage fol-
				lowed by autogenous vaccines
				with prompt recovery without
				incision.
No. 12.	None.....	B. fusiformis....	Acute Alveolar	
		Strep. pyogenes..	Abscess.....	Ordinary acute type.
		(few)		
No. 13.	Strep. pyogenes.	Strep. pyogenes.	Acute Alveolar	Hard brawny swelling. Sev-
		(few)	Abscess.....	eral ineffectual attempts to
		B. fusiformis....		void pus in mouth. Fifth day
				pus evacuated externally by
				incision. Toxemia very pro-
				nounced. Acute nephritis.
				Temp. 102°, weak, rapid, un-
				even pulse.
No. 14.	None.....	Strep. pyogenes.	Acute Alveolar	
			Abscess.....	Ordinary acute type.

The result shown by this series of cultures is not just what I had expected. We will continue investigations to discover if these fully represent the truth and try to discover through the bacteriology a cause for the difference in clinical variations.

The natural sequence of an acute typical abscess is the condition ordinarily termed chronic alveolar abscess. This chronic condition may be expected unless there is thorough disinfection and filling of the root canals after the subsidence of the acute condition. Even after the most careful treatment of root canals, in some instances the chronic condition will follow. This may be due to over treatment; to the character of medicaments used in root canals, to the denudation of the apical portion of the root, causing a limited necrosis resulting from destruction of the investment membrane, or to the non-resisting power of the tissues in the apical space, rendering them intolerant to substances employed in root filling.

The periodontal membrane is a specialized tissue and does not react to serious inflammatory processes. When this membrane is once destroyed it is never reorganized as a special organ, therefore that part of the periapical tissue destroyed leaves this amount of the cementum of the tooth's root dead, and there is no power known which can revivify it. It may remain for an indefinite period without harm to the individual, but it is a continuous source

of danger. It cannot be sequestered as may be the case in a part of a necrosed bone.

There are two kinds of chronic alveolar abscess; those having a sinus through which pus periodically or continuously discharges, and those having no definite sinus for pus exit, in other words the blind abscess. The diagnosis of that form which discharges pus through a sinus in the gums is not usually difficult. If a sharp steel probe be introduced into the pus sinus and the canal followed by the probe until it reaches a cavity in the bone, and if the probe comes in contact with a denuded root, such a clinical manifestation is indicative of chronic alveolar abscess. If this evidence be supplemented by radiography, we have both ocular and tactile evidence.

The blind abscess is not always so easily made out. If on careful examination of the gums overlying the apical portion of the roots of teeth, we find a darker color in some one locality than is found in a similar locality on the opposite side of the jaw, suspicion should be aroused. In such cases an attempt should be made to penetrate this area with a sharp steel probe. If after the cortical portion of the bone is pierced the instrument drops into a bone cavity, excluding a cyst, we may be reasonably certain that an abscess exists. For diagnosis of chronic blind abscesses the radiograph affords the best possible evidence. Still, even this aid in rare instances may lead one to wrong conclusions. Suppose that an acute typical abscess has once existed and is followed by a chronic abscess. Under proper treatment this may have been cured, the root filled, and the abscess cavity filled in with cicatricial tissue, minus lime salts, otherwise the conditions are normal. A radiograph of such a case may indicate a cavity in the bone. In such cases we must depend upon the history, appearance of the overlying gum, and the condition of the teeth, arthritis, endocarditis, neuritis, nephritis, erythemic patches on the face, and other pathological manifestations. If any of these conditions exist and no etiological factor has been discovered as a cause for their existence, then radiography and other diagnostic methods should be applied to the jaws and teeth to determine whether a cause may not be discovered there.

The fact must not be overlooked that tuberculosis and actinomy-

cosis of the jaws may present some of the symptoms of chronic alveolar abscess. Enlargement of cervical and submaxillary lymph nodes is not an uncommon clinical symptom of chronic alveolar abscess, especially in children.

The treatment of acute typical alveolar abscess should be varied with the case, since no one method is equally applicable to all. The stage of the disease when the patient is first seen, the location and nature of the infection, and other factors, must determine the treatment. If the patient presents in the early stages of the infection, that is the early stages of incubation, abortive measures are indicated, but this treatment is not indicated if the progress of the infection is too far advanced. If there are indications of pus formation the root canals should be opened, if this may be done with the minimum of traumatism to the already inflamed root membrane. In opening the root canals support should be given the tooth while cutting into the pulp chamber. To support the tooth, mold softened modeling composition to the lingual and buccal or labial surfaces of the tooth involved and those adjoining, and then chill it. Remove the compound and trim so that the splints may be firmly held in place against the teeth while drilling. If but little pus has been formed and the root canals are not too small, it may, in some instances, be drained through the tooth and the pressure relieved. With relief of pressure the pain usually subsides. As much as possible of the dead matter in the canal should be removed mechanically and an antiseptic dressing should be loosely applied and sealed in. The patient should be instructed to return if pain recurs, when the dressing should be removed and the pus again evacuated. It may be necessary to repeat this operation several times before pus formation ceases.

If the root involved carries a porcelain crown, or if there are large thick hard inlays or fillings in the tooth, their removal should not be undertaken, unless easily accomplished, since the operation for this purpose may serve to increase the injury of the apical tissues. Gold crowns may be drilled through, as a tooth is drilled.

Several small doses of calomel followed by salines is indicated. Mercury seems at times, to have an inhibitory influence on infections in the jaws, while cathartics are beneficial on account of their eliminative effect.

With evidence of pus formation, which cannot be drained through the pulp canals, it may, if the root involved can be determined and is accessible, be evacuated by drilling through the process to its apex. This procedure may cut the infection short. Before this method is employed one should be reasonably certain that pus is present, otherwise a bad condition may be made worse. In some jaw infections the swelling appears slowly, is very hard, and while there may be systemic indications of pus, it may not be present in sufficiently appreciable quantities to be discovered. In such infections even slight trauma caused by surgical interference seems to intensify the condition.

If the swelling is hard or brawny and the process is slow, with a low grade of fever, we should be cautious about extraction of teeth or of making incision in the mouth.

Cold applications to the gums or face is helpful in the early stages of inflammation, but is contra-indicated later. Hot boric solutions externally applied are beneficial in most cases, especially when abortive measures have proven futile. Fomentations applied to the face induce hyperemia and are soothing. Objection is made by some to the application of fomentations, since they are supposed to precipitate pointing on the face. I have not had this experience.

Relief of pain is always indicated. If this is not accomplished by hot fomentations, then drugs should be employed for this purpose. Aspirin, or sodium salicylate, will often relieve pain and either is to be preferred to the coal tar products, which are more depressing. If these drugs fail, morphine may be depended upon to give relief. If the patient's temperature is elevated he should be put to bed and soft or liquid diet prescribed. If the mouth is fetid a solution of permanganate of potash, 1 to 500, should be used as a mouth wash.

The pointing of pus in the ordinary acute typical alveolar abscess should be expected in twenty-four to forty-eight hours. In order to avoid the burrowing of pus sub-periosteally in such an abscess, early incision, down to the bone, should be made. This opening should be maintained by the introduction of small tents made of cotton dipped in phenol. Alcohol should subsequently be applied to counteract any excess of phenol. Previous to in-

cision in the gum for the evacuation of pus, when palpation discovers it, the tissues to be incised should be sterilized with 50% alcohol.

When pus has been discovered it should be promptly evacuated, as early drainage is of utmost importance. It prevents burrowing, and minimizes the danger of septicemia or septic emboli. In making incision for the evacuation of pus the cut should be sufficiently extended to facilitate free drainage. I have not found irrigation of pus cavities beneficial and it is rare that tubes or other means of drainage need be employed inside the mouth, if the pus is superficial and the cut has been sufficiently extended. Peroxide of hydrogen should never be injected into pus cavities for reasons too well understood to need mention.

One hears the opinion expressed that external incision for the evacuation of pus from alveolar abscess is never justified. The reason given is that it leaves a scar. I am of the opinion that a small linear scar is to be preferred to an ugly disfiguring scar which may result from permitting the pus to point on the face without surgical aid; besides delay in discharging pus may result disastrously from general infection. The object of pus drainage is to lessen or prevent toxemia. Alveolar abscess is not without danger and one is not justified in taking chances with his patients, especially if they may be avoided. In serious inflammation in the region of the angle of the mandible, accompanied by much swelling and trismus pus is not easily evacuated into the mouth. Incision inside the mouth in such a case may not reach the pus, and even if it is reached, on account of the swelling it may be difficult to fully evacuate it and keep up the discharge. In such a case it is far safer to make an incision through the skin under the base of the jaw followed by blunt dissection until the pus is found. Gravity favors the discharge from such an incision and drainage is more easily maintained. Pus like water, drains best down hill. The scar of such an incision is linear and not easily observable. The one method is poor surgery, the other good surgery.

One case from my service at St. Luke's Hospital may be cited to further illustrate. Patient, man, aged forty years. Abscess of the right lower second molar was first observed on Friday. On Sunday there was much swelling and edema. The phy-

sician in charge made an attempt to evacuate the pus inside the mouth, but failed to find it. On Monday he made a second attempt with like result. I was called on Tuesday. The patient showed evidence of a pronounced toxemia. The pulse was weak, uneven and rapid temperature 102° , breath very fetid. Urinalysis showed an acute nephritis. I made an external incision through the skin followed by blunt dissection until I reached the pus. It was discharged in large quantities and was very fetid. Hot boric dressings were applied. The following day the fever had subsided and on the fifth day the casts and albumen had disappeared from the urine. The odor of the pus indicated the *B. fusiformis*, and bacteriological cultures, made for me by Dr. Moody, discovered this organism and also streptococcus pyogenes, both aerobic and anaerobic.

Sometimes the patient is not seen until pus has reached the skin and is about to point following ineffectual attempts to discharge it in the mouth. If such an abscess is permitted to open on the face without surgical assistance, a disfiguring scar results which might have been avoided by external incision.

Prior to external incision the skin should first be cleansed with soap and water and then with 50% alcohol, or the surface painted over with tincture of iodine. After the skin has been incised, if the pus is deeply located, a blunt dissection should be made into the pus pocket, since there is less danger of injuring important structures by this method than if made wholly by the knife. If the pus pocket is deep, some sort of drainage is desirable. Fenestrated rubber tubes or gutta percha tissue may be employed. The whole of the affected area should be covered with a number of thicknesses of gauze wrung out of a hot boric solution, which dressing should be frequently renewed. The dressing should be covered with rubber dam, oil silk, or gutta percha tissue, and supported by a suitable bandage, and the patient put to bed. Following the free evacuation of pus the fever and the other symptoms usually promptly subside.

The old rule for the treatment of surgical diseases, and one which may generally be followed, is to remove the cause. If this rule were followed in the treatment of alveolar abscess the tooth would be extracted, but this is not always desirable, neither is it always a safe practice. Many abscessed teeth may be re-

stored to health by treatment, and serve the purpose for which they were intended, without prejudice to the patient's health. Another reason why teeth may not always be extracted is because of the danger of augmenting the already highly septic condition if the operation is performed at certain stages of infection. It may be difficult accurately to state at what stage this danger exists, but that there is danger due either to the stage or to the nature of the infection seems to be undoubtedly true. Some believe that an abscessed tooth may be safely removed at any stage of the infection if its socket be thoroughly disinfected. My clinical experience does not permit me to coincide with this belief and others also hold a similar opinion. Blair, for instance, says in his "Surgery and Diseases of the Jaw," "If after an infection has spread beyond the alveolar process, it is decided to remove the offending tooth or roots, we believe there is sound reason in waiting for the acute symptoms to somewhat subside." If after a tooth has caused an infection and a considerable area has been involved in sepsis, its extraction can be of no immediate benefit other than to afford drainage, and to afford opportunity to apply antiseptic dressings to the inflamed area. If pus formation in inappreciable quantity has just begun, but with considerable area of bone involved in septic inflammation, the traumatism caused by extraction further lowers the vitality of the tissues and consequently renders them still more susceptible to pyogenic influences. Nature may not as yet have had time to protect the already inflamed tissues, and the danger of increasing the morbid condition is augmented. It is difficult to understand how antiseptics may be sufficiently disseminated when applied to the tooth's socket to include more than the superficial areas involved. In addition the exposing of the inflamed tissues by extraction, to other pathogenic bacteria from the mouth, may give opportunity for symbiotic action of two or more organisms, which may greatly intensify the disease. Incisions in the mouth may also prove baneful in some kinds of infection.

In the treatment of chronic or sub-acute alveolar abscess one of two methods is employed. If the peridental membrane has been destroyed to a very limited extent in the apical space, the disinfection of the canals and apical space will generally bring about a cure, when the root canals may be filled. If after dis-

infecting the root canals in those cases before indicated, the abscess does not yield, 95% phenol forced into the limited suppurative area at the end of the root, followed by alcohol, often gives good results. I am aware that this treatment is condemned by many good practitioners. It is true that great injury may be done by injudicious use of this remedy, but this is no valid reason why one should not employ it under proper restrictions when clinical experience has many times proved its efficacy.

If the sharp steel probe and the radiograph indicate that a part or all of the apical third of the root is denuded and rough, and discovers that a considerable area of bone has been destroyed, surgical interference by the old method employed by Homer Judd, forty odd years ago, of resection of the denuded part of the root and curettment of the pus cavity, is indicated. If the root has been necrosed so as to include much more than the apical third with extensive destruction of bone, then extraction is indicated. Resection of the roots of the bicuspid, cuspids and incisors is not a difficult operation. The buccal roots of the upper first molars may also be excised for the cure of persistent alveolar abscess. This treatment is not always applicable to the roots of the other teeth.

The work of Billings, Hunter, Rosenow and others, has demonstrated that serious lesions may result from chronic jaw infections. These findings should lead us to view all foci of infections in the mouth with seriousness.

Following the subsidence of the acute symptoms in streptococcus infection, autogenous vaccines are useful in preventing secondary attacks. In chronic or sub-acute abscesses, unless there are joint or other foci of infection, vaccines are not indicated, thorough surgical removal of cause usually being sufficient.

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LIABILITY OF DENTISTS FOR MALPRACTICE.*

BY LON O. HOCKER.

The liability of a dentist for malpractice is the same as that of physicians generally, and the general principles of law governing the conduct and responsibility of physicians in general is applicable to that of dentists.

A dentist, or one holding himself out as such, is required to possess the qualifications and skill generally possessed and exercised by dentists practicing in similar communities. Failing to possess such skill he is liable for ill effects which the possession of such qualifications and skill would have avoided in the particular case. Whether or not he possesses such skill, he is liable for ill results caused by negligence, which is the failure to exercise the care and skill of ordinarily careful and skillful dentists practicing in similar communities.

This standard of qualification and care may seem rather abstract, but it is about the best that can be worked out as a principle upon which concrete cases can be determined. No concrete rule can be stated which will fit the varying facts and circumstances as they arise in particular cases.

The law recognizes and, indeed, is based upon human nature, takes cognizance of its weakness and imperfections as they are found in the generality of mankind, and therefore sets up as the standard of human conduct in most of the affairs and relations of life the conduct of the ordinarily careful person. This standard of care is the measure of responsibility in ordinary business dealings and in the conduct of all professional men. The ordinary practitioner of medicine, the surgeon and the dentist are required to possess skill and to exercise the care of ordinary practitioners in similar communities. A specialist is required to possess the skill and exercise the care such as is usually and ordinarily possessed and exercised by specialists in similar localities. A practitioner who belongs to a particular school is required, in the treatment of diseases or injuries, to follow the recognized practices of the school to which he belongs, and a departure there-

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from (except under extraordinary circumstances such as to create a doubt as to the propriety of pursuing the usual course,) will put him to the hazard of civil responsibility for results.

In determining the degree of learning and skill required of a physician or dentist regard must be had to the state of medical or dental science at the time. The practitioner is not required to possess the skill of thoroughly educated physicians or of those who have had unusual opportunities in the way of experiment and study, but simply that of the average of the profession. The same degree of skill and care is required of a physician or dentist in respect of diagnosis as in respect of treatment. Such practitioners are not required to warrant or insure that the treatment will be beneficial or result in a cure, nor are they responsible in damages for want of success, except where it is the result of a lack of ordinary skill and care. The fact that unexpected and ill effects result notwithstanding the treatment is, in itself, no evidence of neglect or want of care.

A physician or dentist is not bound to render professional services to every one who applies. He is not liable for a refusal to render professional service although he may be the only one available for such purpose. The same degree of skill and care, however, is to be exacted of a physician and dentist whether he acts for compensation or gratuitously, and his responsibility for a failure to exercise skill and care is to the patient, notwithstanding the physician may have been called by a third person and may be looking to such third person for his compensation.

Where a patient is in the possession of his faculties and able to consult about his condition, and where no emergency exists making it impracticable to confer with him, his consent is necessary to a surgical operation. Consent, however, will be presumed when voluntarily submitting to an operation, in the absence of false representations. Where an emergency arises demanding immediate action for the preservation of life or limb and it is impracticable to obtain the patient's consent or the consent of those who are authorized to speak for him, it is the duty of the physician to perform such operation as good surgery demands, without his consent; and if, in the course of an operation, a physician discovers conditions not reasonably anticipated which

require a further operation, the physician will be justified in doing whatever is reasonably necessary. It is the duty of the physician or dentist after an operation to give instructions to the patient for his care and attention, and he may be held liable for failure to give such instructions when they are necessary.

Many conditions arise in the course of the practice of physicians and dentists when there is no hard and fast rule by which they can be guided in determining what course should be pursued in respect of treatment. Again, many cases arise where the diagnosis is of a doubtful character. Under such circumstances the practitioner is only required to use his best judgment, and if he possesses the ordinary skill of the average practitioner, he will not be legally responsible even though his diagnosis is incorrect or the treatment is not the treatment best calculated to produce curative results. In all matters of doubt a physician is entitled to use his best judgment and is not liable for mere errors of judgment, provided that he brings to the case that ordinary skill which the law requires he shall possess. A physician is liable for a mistake or error in writing a prescription if ill effects follow to the patient.

In the ordinary suits for malpractice it is necessary that the patient shall produce testimony from other physicians to establish the fact that the physician was unskillful or careless in the handling of the case. When a physician is called for this purpose he is what is known as an "expert" in the terminology of the law. He is not permitted to say directly whether or not the treatment given was the proper treatment or not, because the jury is the one to ultimately determine that question. But he is asked a hypothetical question which sets forth the history of the case and the symptoms which manifested themselves, and asked how an ordinarily skillful and careful practitioner would handle such a situation. From the answers given to such questions, and from the testimony as to what the physician in the particular case did, the jury reach the conclusion that the physician exercised proper care and skill or failed to exercise it, and return their verdict according to that finding.

Cases, however, might be imagined and, indeed, have occurred where the inferences to be drawn from the physician's conduct and

treatment would lead to only one conclusion,—that of a want of care or skill,—that the opinion of experts would not be necessary to make out a case.

If physicians were sued for injurious results following the performance of an operation without taking any aseptic precautions for the prevention of infection, it would not perhaps require the testimony of an expert that such conduct was improper in order to permit the jury to pass upon the question of his liability, or if a physician permitted one of his instruments to be left in the body of a patient after an operation it would not require the testimony of an expert that such conduct was not in accordance with proper practice to make that a case for the jury to pass upon. But in the ordinary cases with which the courts are called upon to deal, it is almost invariably necessary to supplement the testimony that the plaintiff offers as to the conduct and treatment of the physician by the opinion of experts as to what is the usual and proper practice and what is not the usual and proper practise.

Physicians who are partners are both liable for the malpractice of either, and a physician with an assistant is liable for the malpractice of the assistant. However, a physician as such is not liable for the negligence of a nurse unless the act of negligence comes under his observation, in which event it would be his own act.

As before indicated, no presumption of improper treatment arises from the fact that the treatment has been unsuccessful. The burden is upon the plaintiff patient to establish the acts of negligence or the lack of skill in the particular case by what is known as the greater weight of the evidence.

A physician is entitled to temporarily leave his practice provided he makes provision for the attendance of a competent physician upon his patients, but for a physician to leave his practice without making such provision or without notice to the patient under such circumstances as would enable him to secure the attendance of other competent physicians would be a breach of his obligation and make him liable for injurious results.

A physician may be liable for performing an autopsy upon the body of a patient even where the patient, in his life time, has given his consent to the performance of such autopsy, where

the legal custodians of the body have not given their consent. This, however, would not be properly classified as malpractice, but rather as a personal trespass.

Physicians and dentists who possess the ordinary skill of their profession and also the prudence of the average man, usually carry insurance to protect themselves against the consequences of malpractice suits. Those who do not usually find it a matter of serious regret, as most any man engaged in either of these professions is subjected constantly to the hazard of unfounded suits of this character. The more eminent a physician is, the greater his liability to be harassed by such suits. In my practice I think I have defended perhaps twenty-five malpractice suits, and in not more than one or two of them has there been any basis whatsoever for instituting the suit. The reason for this may be that the doctors succeed in burying their real blunders.

See II Chronicles, chapter xvi, verses 12 and 13:

"12. And Asa in the thirty and ninth year of his reign was diseased in his feet, until his disease was exceedingly great; yet in his disease he sought not to the Lord, but to the physicians.

"13. And Asa slept with his fathers."

THE POSSIBILITY OF SYSTEMIC DISEASES ORIGINATING IN THE DENTAL TUBULES.*

BY J. H. WOOLLEY, D. D. S., CHICAGO, ILL.

Dr. Paul Ehrlich, of Berlin, has given to the world what the medical men acknowledge as a plausible theory, based upon experimental research work, to explain why systemic affections are the result of certain cells taking up toxic particles in the blood. Only those cells having certain kinds of receptors, either in the nervous, muscular or glandular systems, (each type having a certain individuality of its own) make it possible or impossible to take up these floating particles in the blood be they either toxic, chemical or nutritive. The Doctor's experiment on a rabbit showed that in the nervous system when methylene dye was introduced

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into the body, the nervous system was stained blue, because the cells of that system had certain receptors suitable to take in this particular substance. It was not discoverable in any other part, or parts of the body, because only the nervous system had receptors adapted to take in this dye. Medicine acts in the same manner as to location. For example, strychnine affects the nervous system, digitalis the heart, pilocarpin the excretory system, etc.

May it not be in this same manner that certain kinds of toxic poisons found in the oral cavity, emanating from diseased conditions, find their way to the blood and are taken up by cells having an affinity for a certain kind of toxin, whether they be located in the nervous, muscular or glandular system?

As I understand Dr. Ehrlich's hypothesis to explain the phenomenon of disease, I see no reason why the application may not be made to pathologic conditions of the oral cavity. It is to the dental profession that credit is due for a discovery that has been overlooked by the medical profession; namely, that diseases of the oral cavity are closely related to general physical disorders; so much so, that the physician is beginning to consider it quite necessary to give the subject grave consideration.

A very able and interesting paper delivered by Dr. Wilber E. Post on Oral Infection in Relation to Systemic Disease was read before the Chicago Dental Society, Nov. 19, 1912, from which I quote the following. He says: "It is not to be wondered at then, that the teeth and adjacent structures are so often the seat of infectious disease. The wonder is that a region so accessible for examination and investigation should have escaped so long with so little attention." He illustrates by observations of himself and others on three hundred cases found in the Central Free Dispensary at Rush Medical College and many cases at the Presbyterian Hospital.

"The common lesions have been caries of the teeth, pulpitis, pyorrhea, alveolaris, alveolar abscess, periostitis of the jaw and osteomyelitis of the jaw. The associated conditions may be divided into two classes, the regional and the general systemic affections."

It is due to the dentist that the attention of the medical profession has been called to the fact that general infection in the oral cavity has been shown to be the cause of systemic affection,

and it seems to me that a deeper inquiry and research should be made into this subject."

A little inquiry into Ehrlich's studies on the subject of immunity may lead us to some clue in discovering causes of systemic affection traced to dental irritation, such as imperfect root fillings and lack of care in the treatment of the dental tubules. I will now first refer more particularly, and briefly, to the histology of the dental tubules, and, second, to the care of these tubules by proper treatment and management. "The blood vessels and nerves enter the tooth pulp in abundance; the dentin is originally connected with the pulp by the dentinal fibrils; these are connected with the soft cement corpuscles which again are brought by their process into intimate relation with similar bodies in the highly vascular periosteum, so that between pulp inside and periosteum outside there is a continuous chain of living plasma or lymph." (Tomes.)

A very instructive article was written by Dr. Bödecker and I refer to an excerpt: He says that the "dental tubule is a tissue in its minutest structure, that has been under much controversy. Dentin is made up of a basic substance containing a great number of canals radiating from the surface of the pulp to the dental enamel margins; the canals are lined with the sheath of Neuman, a tissue similar to the basic substance of the dentin, but considerably more resistant to the actions of acids and alkalis. In the center of these sheaths lie the fibres of Tomes." The Doctor believes that the claims made by Romer that the "dental canaliculi contain tubes instead of fibres" seems quite reasonable, if one considers that tubes are of more use than fibres for the purpose of circulation. "If we accept Romer's theory," the Doctor goes on to say, "the only possible explanation is that this has remained un-noticed." According to Romer's calculations as to the number of dental canals or tubules to the millimeter, near the enamel margin, there are 14,700, while in a square centimeter over the pulp chamber, he found the large number of 3,700,000. Assuming, then, the superficial area of the walls of pulp chamber of a molar tooth to be about one square centimeter, the crown would contain about 3,760,000 tubules.

When the teeth are in a diseased condition and these dental

tubules comprising over three millions, are not properly treated through the pulp canal, may not the untoward effect of microbic and gaseous exudates find its way through the tubules into the surrounding tissues of the teeth to different parts of the system through the blood?

As you will remember, Dr. Post claims that "The associated conditions apparently, or actually resulting from these infectious processes, may be divided into two classes, the regional affection and the general systemic affection." To support his theory he gives over 300 cases in which the originating cause was dental irritation.

Many cases bearing out the same theory have come under my personal observation, one of which is so striking as to deserve special mention. A woman, forty years of age, married, in good health, had an attack of pain and numbness in her right arm and hand, so pronounced that she was unable to hold her pen. The pains were more severe at night, causing sleeplessness. She was not aware of any trouble with her teeth, but upon examination, I found that in the right upper third molar, the pulp was dead and there was an accumulation of pus. After proper treatment I found on her return for a second treatment (the following day,) that her arm and hand were in normal condition.

I have looked up the dental literature on treatment of devitalized teeth and have failed to discover any portion of it given to the consideration of the dental tubules as a possible factor for an originating cause of some of the diseases of the oral cavity and systemic affections. They have been considered histologically but have not been considered seriously in our work.

The tubules being microscopic in character are not considered to play any important part from a therapeutical point of view; (it may be because of the smallness of their diameter,) yet, when we consider that the tooth as a whole contains over three millions of these dental tubules, they are of great importance in their aggregate. In a paper by Dr. F. E. Burnett, of Chicago, entitled, "When to Cease Treatment," he says, referring to the smallness of things: "Suggesting the thought of the physical influence of substances occupying small space a few illustrations are given. It is said a grain of musk will scent a room for years. That

an amount of indigo equal to the weight of a small pin will give distinct coloration to a ton of water. That a grain of florescein in a hundred tons of water, will make the water fluorescent, when the water is illuminated. That a pound of yellow ochre liberated on a small stream will tint the water for a hundred miles. That a tooth has been opened, liberating hydrogen sulphid gas, the odor of which could be detected in two adjoining rooms."

"Hundreds of such illustrations might be given, which show the power of matter occupying small space. The facts prove that from small things and small spaces may come powerful influences, and they serve to suggest the influence that may also originate from the space of the apical end of the root canal."

In view of the histological character of the dental tubules, the latter containing nutritious material such as a vicious substance, albumen and circulating fluid, it is evident that their contents are undoubtedly infected, when the tooth, or teeth, become diseased by the devitalization of the pulp.

What, to my mind, is most necessary when these teeth are so affected is to medicate the dental tubules at the same time the root canal is being treated.

Probably the thing I would most wish to call attention to is this:

"We regard the root canal as porous as the honey comb; the very presence of the large number of tubules makes it such. To be sure this root seems solid but it is because these tubules are full of a semi liquid albuminous substance which helps to give the appearance of solid bone. The contents in reality could be resolved in the same constituent parts as we find in serum. This moisture constantly changes and forms its gases which pass out into the circulation. As the case gets older and more putrid the constant absorption which is in the nature of the tooth to do soon is depositing and liberating a serum which is both carrying and is a source of infection."

I am of the opinion the time is coming that the methods in therapeutics will change, that the fluid form of the vehicle in which are the active principles of the antiseptic will be changed from an oily vehicle to a watery vehicle. That is worth inquiry and study by research work. Whether the oily constituent does

not obstruct the tubules, while a watery vehicle with its active principles contained therein would be more powerful.

We will refer to that class of teeth where the pulp has not become thoroughly disorganized. After its removal, there will be remaining along the walls of the canal and adhering to it, some fibrilla that adhere tenaciously and, if not well removed, close the approach to the dental tubules, which prevents disinfecting the latter properly. These fibrilla are difficult to properly remove. It can be accomplished more easily by first using a heated broach (root canal dryer) and you can lessen in a great degree the attachment by partial incineration, and make it consequently more certain of removal. After the removal of this attachment, the canals will not admit of medicated oils passing in the tubules without desiccation by heat, because of the previous moisture contained in the tubules, as medicated oil and moisture will not mix.

Heat, also, is a very valuable remedy in lessening inflammatory action.

Dr. Jean Schaffer, professor of diseases of the skin, of the University of Breslau has made this discovery: "To produce stimulating effects of the skin, he uses a form of superheated dry air applied to the surface above the inflammation. Astonishing results were achieved. Circulation was re-established, and even tissues that before would have been described as dead beyond all human aid, were restored to the normal functions of life."

Such has been my experience in treating the inflamed condition of the teeth, by the aid of the root canal dryer. The heating of the dental tubules through the pulp canal gives a chance for more perfect medication of the tooth and also destroys micro-organisms.

The late Dr. George Cook made some interesting experiments of heat as destructive to pathogenic germs.

He began a series of experiments to determine how much heat was necessary to destroy bacteria and its effects on dentin, and I quote him. He says he found 90° C. in most all cases kills

bacteria in pulp canals, the heat being applied ten minutes when a root canal dryer was used. After two or three applications, he found by tests in a number of experiments, at various degrees of heat, that three applications of $4\frac{1}{2}$ minutes each destroyed micro-organisms.

Is it not true, then, in consideration of the fact that cleanliness is essential in the whole structure of the tooth, that to take the care necessary to make it so, is a practice to be sought after? That the dental tubules need much care in their cleansing, should be conceded to be a scientific fact. Because these tubules are in point of diameter small, they must not be overlooked. The mass of the profession have been hypnotized by a great many of supposed authority into the belief that it is impossible to know surely that in the instrumentation of the pulp canal we can explore its entire length, which belief lessens the responsibility resting upon us and makes us feel that if we do the best we can, we are not to blame if dire results occur. While this kind of reasoning lessens our responsibility, it tends to lessen the effort necessary to overcome these difficulties referred to and leads to slipshod methods. Much effort and experiment is necessary to the proper study of this subject, and instrumentation on teeth out of the mouth will greatly assist us when we operate for patients in these cases.

Much could be written upon each point referred to in my paper. My main object has been to try to show that regional and systemic affections of both the oral cavity and of the body may be explained by the chain and lock theory of Dr. Ehrlich, as herein outlined.

I further touch briefly upon the histological character of the dentin, which contains over 3,000,000 tubules and hope to have laid the foundation for a discussion as to the necessity of their right treatment. I also raise the question as to, whether being overlooked, the poison exudates contained in the tubules may not cause diseased foci in the oral cavity, which in turn, may be the cause of grave disorders in various parts of the human system.

A full and free discussion of these topics is invited.

HOW IT WAS DONE IN OLDEN TIMES.

BY LOOMIS P. HASKELL, D. D. S., CHICAGO.

When I began dental practice upper dentures were held in place by spiral springs which curved around in the cheek, attached to the denture between the molars and bicuspsids. In case it was only an upper denture, the attachment was made to the lower jaw with a gold band on a tooth. Plates did not cover the palate as it was not necessary. In London fourteen years ago I was surprised to find dentists still using this method.

In 1844, my preceptor conceived the idea of securing the plate in place by suction. In order to do this more successfully, he thought an impression of plaster would be preferable to the beeswax then used universally. Using the common plaster of commerce he secured an impression, and proceeded to construct a denture on gold for an old man.

His die metal was tin, but as lead for a counter die could not be poured on the tin he cast the counter die first by holding the plaster model, very dry, in the lead, then placing a rim of several thicknesses of paper around the counter poured the tin. Later on he used zinc for dies.

Upon swaging the plate and trying in the mouth he was surprised to see how it adhered. In order to make a test he soldered a loop to the center of the plate, attached a long iron wire, placed it in the mouth, and told the patient to suck it up, then hung a large pail full of water to it, and the pail was suspended. Of course no further use for spiral springs.

It will be observed that the plate came in contact with the membrane all over the jaw. Some years later a dentist named Gilbert, thought to improve the adhesion by means of an air-chamber, and it came into general use, known as the "Gilbert air-chamber."

The original principle of close contact with the membrane is used now, only a "relief" is applied over the hard palate, to prevent the plate resting there and rocking as change takes place, sooner or later on the ridge.

THE REAL MENACE.

BY H. E. BLILER, D. D. S., CHICAGO, ILL.

From clinical activities and deductions we discover that the real menace to the nation is excessive eating rather than the high cost of living as maintained by some contributors of pessimistic articles upholding that contention. The paramount importance of diet in the prevention and cure of disease is daily becoming more manifest, spelling redress to many. Nature contemplates man in simplicity for his maintenance; namely, pure water, air, and food, with an adequate amount of each.

People are prone to consume excessive amounts of food that tickles the palate, rather than eat coarse, wholesome food, essential to assimilation and digestion. Excessive amounts of food are the basic cause of the putrefactive changes in the gastro-intestinal tract, causing bacteria and toxic gases and toxemas, which permeate the entire body attacking the weakest point of resistance causing local morbid manifestations, such as pyorrhea, headache, carbuncle, fetid breath, appendicitis, sluggishness, dizziness, melancholia, and many others. These putrefactive changes start early in life and are ever present from a mild form to complications. It would seem apparent that in youth the peristaltic action, was sufficient to eliminate all waste product, but it is not, which has been fully verified. A large number of ailments, such as piles, fistula, etc., are directly traceable to belt line pressure and a dry and distended colon, which interferes also with the circulation of blood (the sap of life) in other organs, causing systemic stagnation; commonly designated as "Auto-intoxication" (constipation).

Our epicurean habits are not conducive to immunity from the above distressing diseases. We find that apparently healthy persons are rushed to hospitals for operations on the appendix, showing clearly that regular elimination is not sufficient to maintain and retain health. Personally, I have been affected with carbuncle and pains in the appendix, when I was apparently normal. After taking a thorough and efficient course of elimination and giving constant attention the above morbid conditions disappeared and per-

fect health obtained. My hair has stopped falling, with the pink of youth on my cheek and sweet breath, but it has left its mark and I regret I did not discover the cause sooner. I am convinced that the loss of the hair can be traced directly to the destroying toxic gases and toxemas from the gastro-intestinal tract.

WHERE THE FAULT LIES.

In most all diseases a thorough treatment is instituted. With autointoxication (constipation) it is different, in nearly all cases a single dose being administered, instead of taking an efficient course of elimination, for a fortnight—and giving constant attention, for the ailment is always present from a mild form to complications.

SCIENTIFIC ELIMINATIVE COURSE.

If you have plethora and are too fat, which is deleterious to true vigor, and wish to reduce, use castor oil, occasionally, as a laxative, aromatic mineral oil constantly, as an internal lubricant. As the oil is not assimilated, take an efficient vegetable cathartic quarterly, salines twice weekly for kidneys. If you have sclerosis, ashen, or brown color, and wish to take on weight use olive oil instead of the mineral oil, as it is assimilated, being a vegetable oil. By strict adherence to the above use of nature's remedies, you will retain health and vigor serene, which I can verify, from personal experience, and clinical deductions, as I treat many cases of morbid condition daily. Dental hygiene should guard the oral cavity.

When you cure pyorrhea alveolaris you produce a nutritive balance—(normal health.) Your recuperative powers will restore you in proportion to your age. Life is based on elimination, and recuperation and the practitioner of medicine should observe the same cardinal principles. Do the fine spun theorist and enthusiast on the unwarranted use of the knife, antitoxins and serums, etc., do it or do they not? The studied use of generalities by some contributors in their pretended labors for the public good, has made it exceedingly difficult to choose the good from the bad. With no personal ambitions, to exploit, and no enmities to satisfy, I am free to work solely for advancement. The majority of the so called "clinical reports" are pure figments, deliberately worded in

such a manner as to invite the inference that their authors are possessed of exceptional skill in some particular department of science, instead of being truthful accountants of actual research, activities or clinical experience as alleged. A specialist, high in authority, defined surgery as tinkering with a complicated machine (the human economy.)

By lack of air we get pulmonary tuberculosis and kindred lung affections and complications. By lack of water the tissues and organs dry up for want of moisture and nutrition; we become anemic and bilious, with ashen color added to chronic constipation, the cause of many of our ills. It is difficult to maintain a nutritive balance, proper proportions, of the life giving elements.

Nature's natural oils for the gastro intestinal tract (being castor oil occasionally as a laxative—olive or mineral oil constantly as a lubricant) are imperative and necessary to maintain healthy conditions.

Many persons are under the erroneous impression that the drug habit will be contracted by taking eliminatives and giving constant attention. Intestinal cleanliness is a good habit to get, as is clearly indicated, and is as essential as oral hygiene.

Chronic cases require a large dose of castor oil, before taking a vegetable cathartic, thus lubricating the gastro intestinal tract—and avoiding distressing effects, such as headache, dizziness, nausea, etc.

Nature's first danger signals are fetid breath, headache, nervousness and biliousness. If heeded, complicated diseases will be averted. Sane stimulation of all the excretory organs are essential and necessary to relieve systemic stagnation in all abnormal conditions, and in addition keep the skin cleansed. If you weaken by thorough elimination, take more nourishment. If you get strong, you are taking a sufficient amount of the life-giving elements enumerated above.

Prophylaxis should guard the oral cavity by cleansing the teeth, using efficient tooth preparations and antiseptic mouth washes. Teeth aching from nerve affection are easily restored, and it is poor economy to extract them. The reflex action from pyorrhea alveolaris and a germ laden mouth is very deleterious to the en-

tire body. Use Iodin locally, for inflamed tonsils and gums, cold sores, wounds, etc., being a disinfectant of much merit.

Mythology teaches what people merely think, but scientific facts can be easily verified by any person whose mind is not biased. It is the simple things in life that impart enduring nourishment. In science and nature there is a definite reason for everything. If you keep your stomach distended by eating too much, you create a false appetite. Eat less and you will require less, to satisfy you. Disaster in the form of many diseases may be averted by adherence to the simple rules that underly health, eliminative treatment; and diet prevention.

ADDRESS ON OPERATIVE DENTISTRY.*

BY EDWIN T. DARBY, M. D., D. D. S., PHILADELPHIA, PA.

Your President has asked me to address you upon the subject of operative dentistry. He has not limited me in the matter of time, but propriety suggests that the address be reasonably brief. To tell the whole story of operative dentistry in a single address would be impossible, since two of your distinguished townsmen have devoted over 700 pages, respectively, to the subject, and neither claims to have exhausted it. Moreover, the subject is a larger one than it was fifty years ago, when this Society was organized. Science and art have the elements of growth and are evermore unfolding and expanding, and will continue to do so throughout the ages.

The history of operative dentistry in America may be divided into two epochs. The first beginning near the close of the Revolutionary War, when Joseph Lemaire came to this country with the French Army, and as opportunity presented offered his services to the public. His advent was soon followed by the three Greenwoods, Isaac, John and Clark, also by Josiah Flagg, who seems to have had private instructions from said Lemaire. A little later

*Read at the fiftieth anniversary of the Illinois State Dental Society, Chicago, March 23, 1914.

there came upon the scene James Gardette and Edward Hudson, and still later Horace H. Hayden, John Randall, and Leonard Koecker. Boston, New York, Philadelphia and Baltimore seem to have been the centers of dentistry at or near the beginning of the last century. This little band of men were the founders of American dentistry. Tradition tells us that for the most part their operations were simple in character and consisted of extraction and transplantations, treatment for toothache and engrafting upon roots the crowns of human teeth. It is also probable that they carved dentures from ivory and bone. There is little evidence to show that these men made a practice of filling teeth with gold before the year 1800, for Eleazar Parmly said the first gold filling he ever saw was in 1815. Their number was soon augmented by men whose names are historic, Eleazar and Johial Parmly, Elisha Baker, Solyman Brown, Chapin A. Harris, John B. Rich, E. J. Dunning, and Alex. Nelson. These were men of character and they made a decided imprint upon the early history of operative dentistry. Their mission seems to have been to blaze a trail through the forest of ignorance. They had few precedents to follow. Their knowledge was gained from the book of experience, and while it is said to be true of some of them that they concealed their knowledge and imparted it only upon receipt of pecuniary reward, notwithstanding there seems to have been a desire for fraternal intercourse, which brought them together upon occasion for mutual improvement.

Life seems to have run along smoothly until 1833, when the Crawcours, from France, came into their midst and exploited the Royal Mineral Succedaneum, or amalgam of silver filings and mercury. With courtly manners and liveried attendants and copious use of circulars and other means of attracting public notice, they seem to have been formidable rivals of the established dentists of that day, and left in their trail hundreds and thousands of worthless operations before they could be ousted from the country. The strife which the introduction of amalgam in America engendered, lasted for a period of eight to ten years and terminated in what history has recorded as the amalgam war, an interesting episode in the early days of the profession, which time will not admit of relating in detail.

The second epoch of dentistry in America dated from the

founding of the Baltimore College of Dental Surgery seventy-five years ago, for no calling may assume the dignity of a profession until it has schools and a literature of its own. We have reason to be proud when we review the character of the men who, with independent purpose, separated themselves from the older profession of medicine and established a college for the teaching of dental surgery.

At first its success appeared doubtful, as but few availed themselves of this new means of qualifying for dental practice, and even for many years after its foundation the would-be student of dentistry preferred the preceptorial method of acquiring sufficient knowledge to enable him to start out for himself. In many instances this modicum of information was inadequate to his needs, but it cannot be gainsaid that in spite of the method then in vogue the newly recognized profession had within its ranks men of great skill and force of character, who set examples worthy of our emulation.

It is interesting to note that but twenty-five years elapsed between the founding of the Baltimore College of Dental Surgery and the organizing of the Illinois State Dental Society—a quarter of a century marked by wonderful strides in operative dentistry.

The treatment of the dental pulp had received but little attention prior to 1836, and what had been done was of the most empirical kind. When Dr. Spooner of Montreal suggested arsenious acid for the purpose of devitalizing that organ, there were those in the profession who denounced it as a “deadly poison” and unsafe to use in a human tooth, but, like many other suggestions before and since, it gradually became popular and its use quite general, but the subsequent treatment of the pulp canal was undertaken by but few and for years thereafter received greater neglect than attention. It may be said with a degree of certainty that there were not a dozen dentists in America who had any adequate knowledge of the preparation and filling of the canals of teeth prior to the founding of this Society. It has been said of Edward Hudson that he filled the root canals of teeth, but literature makes no record of his method, nor that it was often done by him.

J. D. White, who swayed the dental scepter of Philadelphia for many years, advocated leaving one-fourth of the pulp at the

apical end of the canal, and filling the balance with cotton and creosote. He also advocated the use of arsenious acid for obtunding the sensitivity in dentine, and packed a paste of the same material around the necks of teeth and left it for several days to facilitate the operation of extraction. Edward Maynard of Washington made broaches of watch springs for the removal of the pulp, but said it mattered little whether the canal be filled or left empty, after the pulp had been extracted. As late as 1862 there was but one set of pulp canal instruments upon the market, and these were so crude in form that only the larger canals in the single-rooted teeth could be filled by them.

The conservative treatment of the pulp was attempted by some as early as 1850 or even at an earlier period. Cappings of lead and gold, quill and horn, and later gutta-percha and asbestos were used. When the oxychloride of zinc was introduced, it superseded all the former because of its plastic properties.

Depleting the pulp, as suggested by S. P. Hullihen, and amputation, as practiced by W. W. Allport and W. W. Codman, was never a popular operation and seldom resorted to.

Another matter which was engaging the attention of the profession between the dates given was the introduction of cohesive gold foil. Most operative dentists had discovered that gold foil was cohesive, but it was a property that they did not desire, and just in proportion as it was cohesive did they object to it. Even as late as 1854, when Robert Arthur advanced the theory that gold foil could be made cohesive by heat, and that this quality was most desirable, dentists continued to assert that "sticky" foil clogged in the cavity and good operations could not be made with it for the simple reason that a different technique was required, but when methods of manipulation were changed and small pieces substituted for large ones and serrated instruments came into general use, then cohesive foil had its advocates, but it was a number of years before the conservative men would admit that it possessed qualities superior to the soft gold which they had learned so well how to manipulate.

The early practitioners experienced many trials and difficulties in their efforts to exclude moisture from the cavity when introducing the filling. Tradition says that until gold came into quite gen-

eral use little effort was made to keep the cavity dry. Dwinelle, with his wax dam, and Robert Arthur and Dibble, with their saliva pumps and tongue holders, aided somewhat in helping to control the saliva, but it was not until S. C. Barnum gave to the profession the rubber dam that dentists felt secure from the inroads of moisture which ever and anon was liable to ruin their operations.

It is sometimes well for the dental surgeon of today to loiter for a moment on the busy highway of life and review the methods of practice and the trials and discouragements which the dentist of fifty years ago experienced. Entering upon the practice of dentistry, as your essayist did, one year before this Society was organized, he is somewhat familiar with the methods then in vogue and with the changes and improvements which have followed.

Let us survey in briefest outline some of the things that the dentists of 1864 were doing and later compare their methods with those which are engaging our attention fifty years later. There is often a tendency to belittle the work of the past and speak of the men who participated in that work as antiquated or primitive, but it cannot be denied that there were giants in the profession fifty years ago. I need only mention such names as Amos Westcott, Eleazar Parmly, E. J. Dunning, John B. Rich, W. H. Dwinelle, W. A. Bronson, Benj. Lord, C. E. Francis, Daniel Harwood, Joshua Tucker, John H. McQuillen, C. N. Peirce, Geo. T. Barker, Jonathan Taft, W. W. Allport, G. V. Black, M. S. Dean, Geo. H. Cushing, Robert Arthur, Edward Maynard, W. H. Atkinson, W. G. A. Bonwill, and scores of others worthy of mention, to convince you that no inferior order of men were contemporary with those who founded your Society.

What were these men doing in 1864? They were filling teeth with gold and tin foil quite as generally as is being done today. Amalgams were in general use, but they were poor in quality, composed of equal parts of silver and tin and often made in the laboratory of the man who used them. Gutta-percha, or Hill's Stopping, as it was then called, was used to some extent. The only cement then in use was the oxychloride of zinc, and that was variable in quality and its lasting properties doubtful. The file was much used for effecting space and most fillings were flat or flush with the walls of the cavity into which they had been in-

sented, often leaving V-shaped spaces between bicuspid and molars into which food became impacted. The restoration of the surfaces of the teeth lost by caries or otherwise was little practiced. W. H. Atkinson had recently removed from Cleveland to New York and was promulgating the use of the hand-mallet for packing cohesive gold foil into cavities from starting point to finish, thus amplifying upon Dr. Merritt's suggestion of its use in condensing only the surface of fillings. Royal W. Varney was then a student of dentistry, but later one of the first to restore all surfaces lost by caries to their original shape. Marshall H. Webb was a school-boy in Lancaster, Pennsylvania, but destined to become a rival of Varney and one of the best operators the profession has known and a martyr to the principles which he preached and practiced, namely, the restoration of the forms of teeth with cohesive foil.

The crowning of roots of teeth was but little practiced except where the wooden dowel (or the wooden dowel reinforced by a gold wire) was employed, and the difficulties attending this operation and the offensive character of the work when completed were so great that it was not generally practiced. The preparation of the roots of teeth to be thus crowned must be done entirely by hand, and if the laboratory happened to be quite remote from the operating room the number of visits from one to the other in the effort to adapt the crown to the root was such a tax upon the operator's time and strength that it made the work most discouraging.

The shell or gold crown was then unknown and could not have been employed as now because there was no suitable cement with which to set the crown, likewise the various methods of crowning which are common today were practically impossible for the same reason that no cement except gutta-percha was available, and this last was seldom used except for temporary fillings.

The operative dentist of fifty years ago who was not skilled in shaping and tempering instruments was at a disadvantage because there were few men in the trade who made instruments of superior quality, and the patterns were more or less crude. Recall the rosewood cabinet with brass corners and beautiful finish, filled with handles of mother of pearl and onyx, gold ferruled and clumsy and contrast them with the delicate and finely finished instruments of today, and we may wonder that good operations were ever made,

but necessity has ever been the mother of invention. The necessity was felt and hundreds of men with the inventive spirit were at hand and instruments and appliances were ever and anon being introduced as the necessity for them was realized, and the needs of the profession were supplied.

In 1864 the rubber dam was introduced, but at first its use was limited because of the difficulties attending its adjustment on the posterior teeth, but how quickly the inventive resources of the profession supplied the clamps which made possible its use in all positions in the mouth. Recall the ingenuity displayed in the various automatic, electric and mechanical mallets which made it possible to do away with the assistant and hand mallet when packing gold. Recall also the introduction of the dental engine in 1870 and '71, and consider for a moment what that meant to the dentists of that day and what it means to the profession of this day. It has practically revolutionized the methods of practice and made possible the things which the dentist of fifty years ago would not have undertaken. Serious problems were engaging the attention of the dental surgeon between the years 1864 and 1874. One of these problems was the treatment of proximal surfaces. The literature of the profession of that day is teeming with the question, "flat fillings versus contour." In the light of our present knowledge it may seem strange that there could be any question among thoughtful members of the profession as to whether the natural forms of the teeth should be retained, or, if lost by caries or otherwise, should be restored. Many of you will remember when Robert Arthur, with intellectual skill, promulgated the theory that all permanent teeth should be separated to protect their proximal surfaces from caries, and with what child-like faith hundreds of the dental profession followed his example and with chisel and disk cut V-shaped spaces between teeth, both sound and diseased, and this, too, in spite of their better judgment, knowing that it was contrary to all of the laws of Nature pertaining to the teeth. You will also remember how profoundly penitent the profession became when it learned that these cut surfaces did not remain separated for the teeth soon came together and caries made havoc with such surfaces, and the impaction of food substances upon the gum made mastication difficult and painful, and pericemental irritation cer-

tain, until such cut surfaces had again been restored to their original contour. Fortunately for the public, there were men in the profession who sounded the alarm early enough to arrest the attention of those who were following Dr. Arthur, and one year was sufficient to convince the most enthusiastic follower of this unscientific practice that the whole principle was wrong, and not only wrong, but pernicious.

The late S. G. Perry, in his masterful paper of 1877, entitled, "The Management of Proximal Surfaces of Bicuspid and Molars," gave one of the first and most important contributions upon the subject, namely, maintaining the natural forms of the teeth. It embodied all of the principles which have been advanced since that date for the preservation of the teeth against the recurrence of caries and the complete protection of the gingivae. This paper, and one by Marshall H. Webb in 1881 upon the same subject, did much to turn the tide against the permanent separation of the teeth and the "flat filling" theory, and the restoration of the proximal surfaces of the teeth began to be considered the only rational treatment.

Coincident with this change of method in the treatment of caries there were introduced a number of new filling materials. The oxyphosphates of zinc were new and the quality of amalgams greatly improved. The former made possible the various methods of crowning which have come into such general use, and the improvements in dental alloys have made it possible to effect the restoration of teeth with less laborious effort than formerly.

Time does not admit of a detailed review of the changes which have been made in filling materials, suffice it to say that since your Society came into existence scores have been added to the list: indeed, so great is the number that the practitioner is often baffled to know which is best for the case in hand. When gold, tin, amalgam and gutta-percha were the only ones to select from, it was easier to decide which should be used.

The relative merit of filling materials is a subject worthy of our consideration, for so much depends upon the wisdom of the choice in a given case. Twenty-five years ago gold was regarded the best material for saving teeth, and when J. Foster Flagg announced it as his conviction that, "just in proportion as teeth need

saving, gold is the worst material with which to fill them," the advocates of gold resented the doctrine and declared that any tooth that could be saved at all could be saved better with gold than with anything else then in use. Dr. Flagg was partly right. In the hands of the unskillful there are better filling materials than gold, but the operations which have lasted two-thirds of a century were made of gold, and yet the operator whose desire is to save the greatest number of teeth will not confine himself to one material because it has outlasted any other. The efficiency of the operative dentist is manifest not only in his technique, but often to a greater degree in the wisdom which he displays in the selection of his filling materials.

In the light of our present knowledge it would be folly for one to ignore the valuable properties which are present in many of the plastics, or the saving of time and discomfort to both patient and operator since the introduction of porcelain and gold inlays. On the other hand, it would not seem the part of wisdom to consign all gold plugging instruments to the scrap heap, nor all gold foil to the crucible, because good fillings can be made by the baking or casting process. Who is not perplexed at times to decide which material is best for a given case? The multiplicity of them often confuses, and nice discrimination is often essential.

A few typical cases which one meets in practice may best illustrate what is meant. A robust man of thirty-five presents for treatment. His teeth are yellowish-white in color, rather short than long, with broad occlusal surfaces, short over-bite and a strong mandible with vigorous muscular action. At one period in life he was susceptible to caries, but the free use of tobacco has retarded the progress of the disease, and at the period in question there are open cavities in nearly all of the proximal surfaces of the bicuspid and molars and small cavities in the incisors. There are no restrictions in the matter of time or expense. The one essential is to save the teeth after the best method possible.

Twenty years ago there would have been no question as to the method or materials to be used in such a case. Fillings of gold foil, laboriously made, would have been the method, and in the hands of the skillful operator would have saved the teeth indefinitely, and if then, why not now? This is one of the questions that earnest

thinking men are asking today. Inquiries are coming from all over the world. They are of the following character: Can I save these teeth with gold and porcelain inlays as well as with foil fillings? Can I save them with any of the improved plastics as well as with foil fillings? In short, is there any recent method or material that will save these teeth as well as the old method? The answer to these inquiries would be as follows: In the bicuspid and molars gold inlays properly made in cavities properly shaped may save those teeth as long as foil fillings, and the patient and operator will be saved discomfort and fatigue. But what about the small cavities in the incisors? If caries has not progressed to such an extent that labial cutting is demanded, foil fillings will serve a better purpose than gold or porcelain inlays. It is to be assumed that the fillings in the oral teeth are not exposed to such an extent as to be unsightly.

Our next case is a lady of thirty years, Spanish by birth, with dark skin, hair and eyes peculiar to her race. Her teeth are beautiful in shape, milk-white in color, but in early life had become carious and filled with cement, not once only but several times. The six oral teeth have lost considerable of the labial walls. The impression given is a beautiful woman with bad teeth. What shall we do? To put gold in these anterior teeth with a background of dark skin, hair and eyes is to call the attention of all who see her to a dental exhibit both beautiful and ugly. Such a thought cannot be entertained. Our artistic sense would be shocked beyond endurance. What is the alternative? Shall it be porcelain inlays or synthetic enamel, will either be permanent? Which will look best at the end of three or five years? It is a problem that confronts us. Ten years ago we would have enthusiastically proclaimed in favor of the porcelain inlay, and would today did we feel sure that our porcelain inlay would look as well as the end of three or five years as it did the day that we set it. A rare type of skill and artistic sense is essential to the making and setting of porcelain inlays, and unless one has that skill and all that should go with it he will not often realize the degree of perfection which such work should possess. As to the synthetic enamel your essayist would speak cautiously and guardedly. Two years' experience with it has rather increased than diminished the confidence which was

placed in it. There can be but one opinion of its beautiful appearance when properly shaded and artistically placed. What its lasting qualities will be only time will tell, but if it lasts three or five years and arrests caries during that time there should be no cause for dissatisfaction even though a renewal is needed. It is worthless for contours or where great stress is brought upon it. Its chief value is in the anterior teeth and in cavities surrounded by four walls.

Our next patient is a golden haired girl of ten years. As she takes her seat in the chair and we look into those blue eyes, we recall the pictures we saw in our youth of the white robed company of angels around the Heavenly Throne. We look the second time to see if wings are starting, but no! she is of the earth, earthy. What does her mouth reveal? The crowns of the temporary molars have dissolved away and the bicuspid's are forcing their roots to the surface of the gum. As our eye travels backward we find the first permanent molars large and beautifully white, with long cusps and correspondingly deep fissures. Caries, light in color, has worked havoc with the occlusal surfaces. When the cavities are ready for the fillings there is little of that surface left. With what will you fill such a cavity in such a tooth? Will you apply the rubber dam and subject that delicate child to an hour of torture in the effort to fill them with gold foil? Will you fill them with amalgam and hope that they will be preserved? Or will you do the wiser thing and omit the rubber dam and ask your assistant to prepare at the proper moment a mix of the black oxyphosphate of copper, and when the cavities have been dried, carry the cement in one large mass into each cavity and then touch the ball of the index finger to a cake of cocoa butter and with that finger force the cement into and over the entire occlusal surface and hold it there sixty seconds. But you say it is black and unsightly. Yes, it is black but in contrast with those white teeth it is beautiful, and it is beautiful just because it is the best thing that could be used in those frail teeth. It will last three and perhaps five years and by that time the little girl will have become a young woman and something better may be known. Meantime, those teeth are safe from the recurrence of caries and you have the satisfaction of knowing that you have not discouraged a delicate child in your effort to save her teeth.

Let it not be inferred from the foregoing that your essayist is of the opinion that gold foil, both cohesive and non-cohesive, has no place in daily practice. For pit and fissure cavities and for all cavities of moderate size elsewhere situated no better material has as yet been suggested. That it is inharmonious in color, that it requires a higher degree of skill in its manipulation than the plastics, and that it is not a time saving method of filling teeth, nevertheless, it will find favor until such time as a better material is at hand.

But you ask, has amalgam no place in dental practice? Yes, it has a large place because seventy-five per cent. of all fillings made are of amalgam, and it has been estimated that there are upwards of two hundred upon the market. Of this great number there are only a few that have special merit. If the better ones are employed and the same care exercised in their use as pertains to gold they will arrest caries, but from the day that amalgam was introduced into America by the Crawcours it has been looked upon with distrust and justly so, because it has been so variable in its saving qualities. Objectionable as its appearance is in the mouth there are few practitioners that do not find it practically indispensable. If other and greater improvements should be made in the formulas it will become increasingly popular.

Finally, the whole story of operative dentistry has not been told nor will it be wholly told, for it is ever changing and ever growing. The methods of fifty years ago are rapidly becoming obsolete. Fifty years hence our successors will wonder that we knew so little, but of one thing we may be certain, the operative dentist of the future will save human teeth with less laborious effort than it has been our lot to do.

THE SCIENCE AND ART RELATIONS OF OPERATIVE DENTISTRY.*

BY EDWARD C. KIRK, D. D. S., SC. D., PHILADELPHIA, PA.

In view of the fact that it has been possible for my distinguished colleague Dr. Darby to keep his promise to be present and address you upon this occasion and to relate in so interesting a way

*Read before the Illinois State Dental Society, Chicago, March 23, 1914.

the wonderful growth of operative dentistry during the half century marking the life history of your Society, I can see little or no justification for attempting to add anything whatsoever to the record of operative dentistry which has been set before you.

There is one aspect of the subject, however, which has made a deep impression upon my mind and which it seems to me is one which should have our thoughtful consideration. No one stage in the development of operative dentistry strikes me as being of so much significance as that referred to by Dr. Darby as that period about thirty-five years ago which succeeded the revolt against the teachings of Robert Arthur and marked the promulgation of the principle of contour restoration rather than flat surface fillings as the correct operative ideal.

The soundness of the principle of contour restoration had its foundations in knowledge obtained in the hard but convincing school of experience, and the price paid for it was the loss of uncounted numbers of human teeth and untold suffering caused by the mutilations of teeth by dentists who had conducted their treatment of dental caries upon the principle of permanent separations and flat finished surfaces.

In 1829 Thomas Bell of London expressed the belief that among the exciting causes of dental caries or, as he designated the disorder, "gangrene of the teeth," was lateral pressure from overcrowding which tended to break down the crystalline structure of the enamel at the point of contact and thus excite a local inflammatory action resulting in death of the structure so affected and producing ultimately what we now speak of as a carious cavity, his idea being that the dead portion disintegrated and ultimately exfoliated in a manner analogous to the exfoliation of necrosed bone.

Throughout the literature of dental caries from Bell's time until the time of Robert Arthur the impression of the teachings of Bell regarding lateral pressure as an exciting cause of tooth decay is more or less evident. Existence of the belief in lateral pressure as an exciting cause of dental caries naturally suggested the relief of lateral pressure as a therapeutic and as a prophylactic measure against caries. The file as an instrument for the removal of superficial caries was already in general use having been recommended by Fauchard as early as 1728, and as a dental instrument is referred to in Artzney Buchlein, published in 1530.

The use of the file as a separating instrument, as a prophylactic means for the prevention of caries upon approximal surfaces of teeth came into use subsequent to the period when Bell announced his theory of lateral pressure as a cause of dental caries, and it is significant that this theory of lateral pressure became not only the justification for the use of the separating file in a prophylactic sense at least, but also determined to a very great extent the technique of the restorative filling operations generally in vogue until the period when restoration of contour became the operative ideal about thirty-five years ago.

It cannot be doubted that the discovery and utilization of the cohesive properties of pure gold foil, promulgated mainly through the teachings of Robert Arthur, exerted a considerable influence in evolving the principle of contour restorations as the correct ideal of operative practice. But by far the strongest influence in that direction was the long record of failures to arrest the progress of decay upon approximal surfaces which had been filed flat and filled flush with the plane contact surface thus produced.

As Dr. Darby has very clearly pointed out in his paper, not only was recurrence of decay discouragingly frequent upon approximal surfaces so treated but as we all know new contact points were formed with areas of susceptibility above the new contact point, leading to recurrence of carious action above the anatomical neck of the tooth, which together with inflammatory destruction of the septal tissues caused by impaction of tough food particles, often created conditions destructive of the integrity of the teeth so treated not to speak of the intolerable discomfort which such treatment caused to the patient. The practice was abandoned because experience showed the method to be faulty in the points to which I have referred, that is to say, because of the pathological reactions induced by a faulty technique based upon an unsound conception of the etiology of dental decay.

Concurrent with the lateral pressure theory of the causation of dental decay but greatly antedating it in the history of its origin was the theory that tooth decay is caused by the acid fermentation of adherent alimentary food particles, from which the deduction that clean teeth will not decay was logically drawn almost coincidentally with the promulgation of that theory, a deduction which per-

sists at the present time but which, like many other dogmatisms, is passing through the crucible of the higher criticism. However, that belief in its soundness was the important factor in determining the technique of contour restorations is evident from the fact that in the writings of those who were advocates of full contour restorations of approximal surfaces affected by caries we find much insistence laid upon the importance of so preparing cavities that the marginal lines of contact of gold and enamel shall be rendered self-cleansing by the friction of food during the act of mastication and by the flow of the oral fluids aided by the movements of the tongue, lips and cheeks. Directions having these objects in view are found in the writings of the advocates of contour operations as early as 1870, and from that period they were increasingly emphasized. Again in this instance we have the operative procedure determined by the prevailing theory as to the etiology of dental caries at that time.

About 1880, and for some years thereafter, the writings of W. D. Miller, of G. V. Black, of J. Leon Williams and a host of others focused our attention upon the more intimate features of the etiology of dental caries, and the outstanding illuminating fact of the relationship of mouth bacteria to the disorder. By reason of the accumulated knowledge concerning the part played by mouth bacteria in the causation of dental caries it became possible for G. V. Black to enunciate what has been properly called his axiom of "extension for prevention."

I have always had reason to doubt that Dr. Black ever enunciated this axiom in the abbreviated and popular form in which I have here referred to it. I quote only from memory, for unfortunately I have been unable in the limited time at my disposal to lay my hands upon the record of the phraseology in the form in which I am sure that I have seen his axiom stated, but if I have not seen it stated in its original form, then I wish to re-state it here as I remember that he verbally stated it to me, as follows: "In the preparation of a cavity for filling, its margins should be placed upon areas of tooth structure that are relatively immune to attacks of caries producing organisms, in order to prevent recurrence of decay."

Let me say here and now and with all the emphasis that I can possibly put into the saying of it, that I believe that statement to be as literally true in the light of our present knowledge, as I be-

lieve in the verity of Holy writ. Or, lest some of you may from a more intimate acquaintance with my agnostic tendencies feel that my belief in Holy writ does not impose a binding obligation on my statement, let me say that I believe in the truth of Dr. Black's axiom as I have quoted it as firmly as I believe that two and two make four. And having made my confession of faith, it is not necessary that I should do more than call your attention to the tremendous effect which Dr. Black's axiom, involving as it does the practical application of our present accepted theory as to the causation of decay, has had in determining our present methods of operative technique. And here again we have the latest example of how our own theories as to the causation of dental caries modify or determine our operative procedures.

Our progress is marked by succeeding steps or stages in operative dentistry as in everything else. We can go safely only so far as we know how to go. If we proceed empirically in the blindness of our ignorance, we run the same chance of going wrong as does the blind man without a guide. I have expressed to you my faith in the soundness of Dr. Black's axiom as I have here stated it, but I wish to call attention to the tremendous importance of a single word in that axiom which I have never thought of without a feeling of profound and reverential admiration for the genius and foresightedness of the man who used it, and that is the word "relatively," for that single word to my mind is in a large sense the way of salvation, not only for the axiom itself but for those who apply it in the practice of operative dentistry.

I find in the records of the monumental, painstaking, and scientific researches that the author of that maxim has given to us and which have enabled him to crystallize into a single sentence the total results of that work in so far as their practical application to operative dentistry is concerned, a record of his effort to find out for himself and to transmit to others his own interpretation of the meaning of that word "relatively," and I find at page 142 of the second volume of his treatise on Operative Dentistry that he made a strict examination of the teeth of ten thousand persons applying for dental operations in the clinic of the Northwestern Dental School in order to determine just what areas of tooth structure were relatively immune to attacks of caries producing

organisms. Doubtless he has made many other observations for the same purpose which have not been publicly recorded, and he arrived at certain conclusions which enabled him to determine with a degree of accuracy a certain method of cavity preparation, but there is G. V. Black, who, on the one hand, is willing to undertake such an investigation for the purpose of finding out the meaning of the phrase "relatively immune," and there are in the whole dental profession very few, painfully few, of whom can give the time or who have the ability even if they had the time to make such a study in order to individually determine the meaning of the phrase "relatively immune," and unfortunately the popular edition of the axiom under consideration does not take into any account whatsoever what I believe to be its feature of essential importance.

All we hear about is "extension for prevention," with the "relatively immune," which is the saving and essential feature of the idea, quite forgotten. And what is the effect? Erroneous deductions are ignorantly drawn from the emasculated catchy phrase "extension for prevention," first, that if extension will prevent, then it is a good thing, and as we cannot get too much of a good thing, let us extend sufficiently and we will prevent altogether. I think it needs no words of mine to convince you that the unhampered practical application of such a misconception must inevitably and does actually entail an amount of tooth mutilation that is not only unwarranted but is likely to be productive of tooth destruction to an extent almost equal to that which was produced by the practical application of the theories of the permanent separationists.

The second erroneous deduction that is ignorantly drawn from the catchy phrase is that susceptibility to dental caries is a function of the tooth surface or some portion of the tooth surface notwithstanding the emphasis which Dr. Black has placed upon what we all consider to be a fact, that caries of the teeth is a factor of the environment of the teeth and not of the teeth themselves. Nothing is more clearly established by the investigation of both dental scientists and from clinical observations than that susceptibility to dental decay as well as immunity therefrom is a variable condition, and that it is due to conditions outside of the teeth themselves.

I have endeavored throughout this communication to show that operative dentistry in the past as well as in the present has had its technical procedures in so far as they relate to the treatment of dental caries determined and modified from time to time by the several prevailing conceptions as to the causation of dental caries as the same is true of all of our therapeutic procedures; we treat disease in accordance with our beliefs as to its causation.

My contention therefore is that we have no moral right to determine the technique of the operation for the treatment of dental caries, especially an operation which is essentially mechanical and which necessarily involves more or less cutting of sound tooth structure, until we have brought to bear upon our problem the best that is known regarding the etiology and pathology of the lesion which we propose to so treat.

In times past the attention of the dental profession, broadly speaking, has in my judgment been focused too intently upon the details of its technical mechanical procedures without giving due consideration to the etiological and pathological factors in the problem.

When the record of the life work of G. V. Black is written it seems to me that the crowning glory of his work will be the record of the effort which he has made to practically define the controlling influence which the biological data of dental disease must exert upon the procedures of practical operative dentistry, and his greatest contribution to professional progress will be recognized as the substitution of the biological ideal for the mechanical.

I have taken the liberty of presenting this subject to you in this way and at this time in the hope, first, that I might by clearly stating my position in regard to the matter under consideration correct certain misunderstandings which seem to have arisen in the minds of some of my friends of the dental profession who have misinterpreted the meaning of some of my previous utterances upon these questions, but mainly because I wish to direct your attention to what I regard as the most important work that as a profession we have now to perform, namely, to reorganize our methods of instruction so that the mechanical art of dentistry and the scientific side of the vital aspect of our dental problems shall be presented to the minds of our students in their correct and

proper relationships, so that the problems of operative dentistry shall in the future be solved in practice by methods which, though mechanical in their performance, shall be executed in the light of an intelligent conception of the etiology and pathology of the disorder which makes their performance necessary, to the end that the mutilations of disease shall not be enhanced by the mutilation of dental art, but that operative dentistry and dental therapeutics shall become synonymous.

PROCEEDINGS OF SOCIETIES.

CHICAGO DENTAL SOCIETY.

A regular meeting was held, February 17, 1914, with the President, DR. GEORGE N. WEST, in the Chair.

DR. THOMAS L. GILMER, read a paper entitled "Etiology, Diagnosis and Treatment of Acute and Chronic Alveolar Abscess."

DISCUSSION.

DR. CHALMERS J. LYONS, Jackson, Michigan:

The essayist has rightly referred to the fact that volumes have been written, in the past, on the subject of abscesses. He states that but two of these writings may be considered classics and both are not of recent writings. In my opinion we can now number a third among the classics on this subject. I am familiar with practically all that has been written about abscesses during the last decade and I must say that this is the most comprehensive and scientific treatise on the subject of abscesses with which it has been my good fortune to come in contact.

I deem it a special privilege to have an opportunity of saying a few words on this paper, not that I feel that I can add anything to the weight of it, for there are few places in it with which I do not heartily agree.

One practical lesson which we may learn from this paper is the fact that the dentist is frequently prone to make a too hasty diagnosis of the abscessed condition when presented. When a pathological condition is present in the peridental membrane the average dentist's first inclination is to lay the cause of the disease

to the doors of a tooth, when the tooth may not be the guilty culprit at all, or, at least, may be only a secondary etiological factor. Dr. Gilmer clearly and concisely points out in his paper and I am sure that clinical experience of many others will verify it, that all abscesses originating in the peridental membrane are not due to poisons and bacteria which have found exit from the pulp chamber or root canals. The essayist has tersely described the structure of the peridental membrane showing that the apical third is rich in nerve and blood supply consequently is more susceptible to infection than any other part of it. The source of pyogenic organisms which have reached the apical space and caused purulent infection is, it seems in the light of our present knowledge, largely theoretical. It is my opinion, based upon clinical experience, that live pyogenic bacteria are carried in the blood in an embolus and when a favorable soil for their growth and development is found in the apical space they escape and multiply and an acute alveolar abscess results, unless the opsonic index of the individual be great enough that the phagocytic activity of the leucocytes be sufficient to overthrow it.

Clinical experience proves to us that in many individuals, the condition is favorable around many of the apical spaces surrounding the teeth for a successful culture field for pyogenic bacteria.

This condition may remain dormant for many years and then readily develop into the most virulent abscess when the proper environment is brought about. The lowering of the resistance of the individual or of that particular part will sometimes set up these violent activities.

The essayist speaks of the symptomatology of abscesses about the jaws being hard to recognize in some cases. In determining some of these incipient abscess conditions we must not overlook the fact that reflected pain may play quite a part in deceiving the dentist of the true state of affairs. We may even get congestion of a part remote from the source of irritation through a reflex disturbance in the sympathetic system whereby dilation of the blood vessels ensues and congestion of the tissues results. To illustrate, a patient came under my observation suffering from what seemed to be an incipient alveolar abscess in the region of the upper cuspid tooth. The tooth was perfectly normal with no cav-

ities present. Tooth responded to percussion, was sore and elongated and had every appearance of putrescent pulp. By using electric and thermal tests it was decided that the tooth was not the guilty culprit. Upon further examination of the mouth and throat a para-tonsillar abscess was discovered. This was evacuated of pus and the disturbance in the cuspid region subsided and has remained in a quiescent state now for three years, showing to me at least, that reflected pain is a factor that must not be overlooked in confirming our diagnosis in many of these conditions.

I want to emphasize the words of the essayist when he says "too often teeth with live pulps have been drilled into in the endeavor to establish the source of irritation."

During the past several years in my work at Ann Arbor I have given the subject of reflected or referred pain considerable attention, and my observations have been that teeth with putrescent pulps may cause the most unexpected consequences in the most unexpected places. Consequently it behooves the dentist to be ever on his guard for these reflex disturbances in diagnosing the initial period leading up to these abscessed conditions around the mouth and jaws.

Recognizing that this condition may be present, we cannot always depend upon the impression of the symptom which the patient will seem to recognize. In this condition the brain is unable to correctly interpret the source of irritation, and the seat of pain. Caution should always be exercised then before opening into a tooth lest we sacrifice a live pulp in an innocent one.

The resistance offered by the periosteum seems to be a great factor in the progress of an alveolar abscess. The essayist has clearly brought that point out in his paper and I am inclined to agree with him that the resistance varies with the individual. In other words the resistance of the periosteum is greater in one individual than it is in another.

The essayist states that "pus discharging through the natural opening of the maxillary sinus into the nose while by no means a positive indication of alveolar abscess may be a symptom of such abscess." I am forced to believe that many of such cases are mistaken for epyemia of the antrum when, if their character is known, they are true alveolar abscesses. On account of the wide variance

in the extent of the walls of the maxillary sinus, when such cases are presented for treatment, as Dr. Gilmer suggests, the first or second molar should be suspected and just recently I have had two such cases under treatment which showed the cuspid teeth to be the guilty members, where the abscess discharged pus into the maxillary sinus from which it flowed into the nose through the natural opening.

The dental profession is very much indebted to radiography as a means of diagnosing many of these pathological conditions and I should like to urge the profession to resort to the radiograph more frequently than they do. By so doing the treatment of alveolar abscess will become more positive and definite and our patients will receive from our hands that true professional service which is their due. Of course there are times when the radiograph may not correctly interpret the exact condition but those cases are so comparatively rare that we are justified to resort to the X-ray in every case when a positive and definite diagnosis can not otherwise be made.

I want to emphasize the point made by the essayist of supporting the teeth when he opens into the pulp chamber by using a modeling compound splint. There is probably no condition confronting the general practitioner in dentistry which is so trying as that of opening into a pulp chamber of one of these sore teeth, and I am sure that the use of the modeling compound splint receives a great welcome both by the patient and the operator.

After opening into the pulp of these infections, I have met with a greater degree of success by letting the abscess drain through the canal for a period of twenty-four hours before applying the antiseptic dressing. After that time the putrescent matter in the canal may be removed and the antiseptic dressing applied and sealed in.

In those infections where the pus seemingly forms slowly and great pain is experienced on the part of the patient, methods should be resorted to that will hasten the pointing of the abscess. I am not yet ready to accept the procedure of using fomentations applied to the face to induce hyperemia. I have always been very much opposed to using them. I have had several cases referred to me where fomentations had been used by the physician in

attendance and disastrous results to the face of the patient had ensued.

The essayist does not speak of any method of attempting to point the abscess inside of the mouth. I have had seemingly good results in these obstinate cases by the use of a capsicum poultice inside of the mouth as an aid in the induction of hyperemia.

If for any reason we cannot point the abscess in the mouth, I quite agree with the essayist in preferring to make a small linear scar by an external incision for the evacuation of pus rather than permitting the pus to point on the face without surgical aid, for then an ugly scar results which causes a bad disfigurement.

However it is our duty to see to it, if possible, that the pus will not point on the face. This is the reason why I prefer the capsicum poultice inside of the mouth rather than the fomentations on the face as an aid to the induction of hyperemia.

Considering the case cited by Dr. Gilmer where a physician made an attempt to evacuate the pus of an abscess of the right lower second molar inside the mouth. This was attempted on Sunday and Dr. Gilmer did not see the patient until Tuesday. The physician did not succeed in evacuating the pus in two attempts, one on Sunday and one on Monday. I am wondering what the result would have been had Dr. Gilmer come into the case on Sunday. I have my own opinion. The average practicing physician in Michigan is not qualified to treat an acute alveolar abscess.

In such cases when we get the patient in the later stage of the abscess we have to treat what is left for us, and are unable to accomplish that which we would consider good surgery under more favorable conditions.

In the treatment of abscesses we should follow the old rule to remove the source of irritation and establish drainage. I beg to differ here with this most excellent paper, where the essayist says if we followed the rule in the treatment of alveolar abscesses the tooth would have to be extracted, which, of course, is not desirable or practicable in the great majority of cases. The tooth itself is not the source of irritation but it is the abnormal condition around the tooth which has to be relieved or removed. When this abnormal condition, which is the source of irritation, has been removed and drainage established, repair will take place.

In my opinion the essayist is right when he says that abscessed teeth may not always be removed without attendant danger to the patient. After an infection has spread beyond the alveolar process, in attempting to remove the tooth some of the septic matter may be forced directly into the blood streams and instead of having septic intoxication we will have true septicemia. The dentist then can use only his best judgment as to the indication for immediate operation.

In all extractions for abscessed teeth I believe the post operative treatment plays an important factor in the process of repair. This is a part of the treatment of abscesses which is too often overlooked and forgotten. In my own experience I have found nothing more efficacious than irrigating with saline solutions and packing with iodoform gauze.

The diagnosis, treatment and post operative treatment of alveolar abscesses have not been given the consideration by the dental profession that the subject merits and I desire at this time to extend my personal thanks to Dr. Gilmer for this valuable, timely, and comprehensive essay on this subject. It is one that should go down in dental literature as one of the masterpieces.

If we will accept these teachings and put them into practical application, we, as a profession, will receive the benediction of an ever grateful public.

DR. TRUMAN W. BROPHY:

I wish to second the statements that were made by Dr. Lyons when speaking of the character of the paper we have listened to this evening. Dr. Gilmer has certainly covered the subject in every detail. The minutiae of his descriptions, the accuracy of his pathology stand as a classic in the literature of the subject. The chief question that I think should be discussed in connection with this paper is what is the actual condition before us? Dr. Gilmer has spoken of the teeth being the cause of the abscess. He has referred to the teeth as the center of infection. In the discussion following by Dr. Lyons, he has referred to the tooth as not being the element of disease; that the tooth is not the real cause of the disease. One having an osteomyelitis in the femur has not a disease of the bone; it is a disease within the bone; it is a disease of the marrow of the bone. The disease that we

are dealing with tonight is not a disease of a tooth but a disease which has had its origin from the pulp of a tooth. Inflammation of the tooth pulp has been followed by destruction and infection of the membrane at the end of the root and the formation of an abscess. I refer to this as a dento-alveolar abscess so as to designate exactly where the disease is. It does pertain to the tooth, but to a certain part of the tooth and not the entire tooth, so that the tooth is no more diseased than the bone is diseased in osteomyelitis, or any more than the skull is diseased in a case of abscess of the brain.

In dealing with this subject, or any other subject we must, I think, consider the nomenclature employed. Therefore, we speak of this condition as a dento-alveolar abscess. It is true, an alveolar abscess may be an abscess of the alveoli in any part of the body, as for instance, of the lung, abscess of the alveoli of the liver or of the kidney or any other tissues having alveoli. To be accurate therefore, in our description we speak of it now in our discussions as a dento-alveolar abscess, and the literature of the profession in years to come will be filled with expressions of dento-alveolar abscess instead of the term that has been so long employed—alveolar abscess.

Another expression which has been used not only by the author of the paper but by the gentleman who discussed it is the word *peridental membrane*. In fact, there is no such membrane. The membrane that invests the roots of the tooth is the *peri-cementum*. It is a term that has been passed down through generations and is now accepted by the Commission on Nomenclature of the International Dental Federation, and also the Commission on Nomenclature of the Institute of Dental Pedagogics of the United States of America. The other term *peridental membrane* has been excluded as not being appropriate since the membrane does not cover the entire tooth. Were it a *peridental membrane* it would necessarily have to cover the entire tooth, the enamel as well as cementum. The only membrane that should be so designated is the dental follicle which exists in embryonal life and later during tooth development.

The abscess that is sometimes spoken of as *pericemental abscess* does not enter into the discussion tonight. The essayist cor-

rectly omitted it since it is an abscess that forms upon the wall of the cementum independent of the tooth pulp. There are so many conditions that simulate a dento-alveolar abscess. We find them all the time, especially in our work, in surgery. Today at my clinic there were three cases that appeared, and I declare that at first I did not know what was the matter. Infection had occurred in one case along the side of the bone and had every appearance of a dento-alveolar abscess with an accumulation of pus along the lower border of the bone, but I found subsequently it was due to an infection of the sublingual gland, and the swelling had appeared just beneath the bone. The teeth were not in any way involved.

I might speak of many other conditions that simulate so closely dento-alveolar abscess, and yet they may be due to some other cause. It requires careful discrimination to determine as to whether a dento-alveolar abscess has formed, or whether the infection is due to something else, and in this connection the Roentgen photograph is very satisfactory and our most reliable guide to enable us to make a distinction between the living pulp and one that is dead. Besides, the use of the electric current will assist us in coming to a conclusion. A simple way is to use hot gutta percha, carry it at the point of the pliers, which will enable one to determine whether the pulp is living or dead.

It is often a matter of surprise to me to see the results in the treatment of these abscesses. The reason why the dentist does not cure alveolar abscess by the ordinary means of opening the canal and cleaning out the contents and making injections through it in these chronic cases is because he does the work at random. He does not do it systematically. He may inject the canal once, carry the fluid into the abscess cavity and out of the sinus and cure the abscess. He may do it in a third or fourth case and the abscess will not get well because he has a complication which is disease of the bone.

The term Dr. Gilmer has employed this evening is most appropriate, namely, periapical membrane that surrounds the apex of the tooth. That membrane is first involved in the formation of dento-alveolar abscess, and when once you destroy the end of the tooth that portion becomes like a foreign substance—it loses

the source of nutrition, the bone surrounding is involved and caries of the bone take place. A sinus forms and fluid passes out through it. What is the matter? It is a complication; it is something beyond the tooth. It is in the bone and at the apex of the tooth calling for surgical measures to bring about a cure. We would not extract a tooth any more than we would amputate a leg in which there was an osteomyelitis. We can cure the disease. We cannot cure the abscess and bring relief by the removal of the tooth for the tooth is not diseased. The disease is in the tissues beyond and perhaps the apex of the tooth root. We treat the case by opening into and through the process, as the essayist pointed out, making an opening sufficiently large to get to the apex. We make an external opening funnel-shaped so that when the cavity fills it will fill at the base. The cavity must be made funnel-shaped so that it will be self-cleansing and granulate, fill up and end the trouble. If you do this you will not have another abscess cavity. It will be found much better than to make an incision and to retract the tissues.

In the opening of abscesses and in making scars, I have been pretty generally outspoken in my belief that there are too many scars on the faces of people. I am a firm believer in that, and I am going to institute a campaign along that line, pointing out to surgeons that there is no necessity in many instances of making external incisions to get into the mouth in order to do operations which can be done intra-orally. External incisions are sometimes necessary, but rarely. The method of procedure mentioned by Dr. Lyons of making use of means of dealing with pus within the mouth is better. I would not want my wife or sister or daughter to have an incision made on the outside of the face when I could just as well make it on the inside and get a better result and save the disfigurement which would occur. It is better to make an incision into an abscess than to leave it to rupture and bring about contraction of the tissues and adhesion to the bone or periosteum. If an external incision is made along the lower border of the mandible, the punctured point cannot move because it becomes absolutely adherent to the periosteum. These incisions can be made within the mouth, the pus cavity drained quite as well and the patient saved the slightest mark on the face.

As to the opening of abscesses and the extent of the burrowing of pus, the most striking illustration I have ever seen of the passage of pus from a dento-alveolar abscess was in a patient of Dr. Deichmiller of Los Angeles, California. He gave me an X-ray picture of the patient and I have it in my possession now. It is a case of an abscess at the apices of the roots of the first molar, which drifted downward and passed over the clavicle and to the sternum where the fluid collected. In order to trace the course of that sinus to its extremity, he made use of bismuth paste. He injected bismuth paste into the cavity of the tooth socket and was surprised to see the bismuth paste go so far. He emptied one syringe, filled another one and emptied it, and filled a third and emptied it. He was absolutely surprised to see so much disappear. In the course of time, after several injections of the bismuth paste, he could not get any more in. He made a skiagraph and found a cavity over the sternum about four inches wide filled with bismuth paste. The sinus had extended from the tooth downward and the infection caused a great cavity in the sternum. In this case the disease was of long standing. The patient had been suffering from it for several years. The removal of a tooth for the purpose of curing an abscess I think is not justifiable except in some cases. If I had a patient who was tuberculous, who was suffering from specific disease, whose tendency was to take on extensive inflammation with slight cause, and there was a possibility of general necrosis of the bone occurring, then I would remove the tooth. But ordinarily I would not.

Again, in an acute case reported before this society a good many years ago, a prominent man in the profession spoke of an experience he had. He removed a tooth for a patient having an acute abscess. As a result he said, the first twenty-four hours the patient felt much better, was absolutely exhilarated, but finally his temperature rose, he went into collapse, and on the third day died. The patient's exhilaration was due to toxemia and that was what sent up his temperature. At first he was stimulated or exhilarated by the action of the toxins but finally went into collapse and died. The dentist was really unconscious of the fact that it was the toxins which led to the death of his patient. To remove a tooth in an acute stage of inflammation or in case of an

acute abscess would not be advisable, lest there might be such a result as I have related.

The teaching of the paper we have listened to this evening will live long after most of us have passed away. It is a paper that can be read with profit. I congratulate the society on having had the pleasure of listening to such a paper and I feel like also expressing my appreciation to Dr. Lyons for coming here and giving us his valuable contribution in the discussion.

I congratulate Dr. Gilmer on his success in bringing together so many facts in such condensed form, even though he says his paper was long, and pointing out to us in every detail the features connected with dento-alveolar abscess. I really could not think of another thing that he might have said on this subject, and so far as I am individually concerned, I thank you for giving me the privilege of expressing my appreciation of what I have heard.

DR. F. B. MOOREHEAD:

I can hardly tell you how much I appreciate this very carefully prepared, thoughtful paper. I do not want to make any statements that might sound fullsome, or that will not bear the light of scrutiny and judgment, but Dr. Gilmer has given us a splendid paper. It is almost Emersonian in its style.

There are two or three items in this paper that ought to be emphasized and one of them is the very great danger of subperiosteal abscess. It is not an easy matter for one to say just what may happen in the event of an appreciable collection of pus under the periosteum, but it is entirely within the province of the dentist to make such a thing impossible. We frequently see an extensive cellulitis, leading to the so-called brawny indurations, or woody phlegmons that are let go day after day with a collection of pus under the periosteum until the bone has been cut short of its nutrition and finally dies. No man ought to consider himself too big to ask for advice in the event he does not understand the case himself. I think it is a mark of greatness on the part of any practitioner to ask for counsel when he is in trouble. He should consider first not his own dignity or feelings, but his patient's welfare.

The second thing that needs emphasis is the bacteriology of

these infections. It is not the staphylococcus pyogenes, aureus or albus, but the streptococcus which is the organism in the premises.

In a number of cultures made from pulp canals, where the pulp tissue was dead, and in which no inflammatory reaction had taken place, the streptococcus viridans was the predominating organism. In many cases it is found in pus culture. That is an exceedingly significant thing when one remembers the work of Rosenow with this organism. He has demonstrated how the viridans may be transformed into a hemolytic streptococcus, or green producers; from an organism of low virulence to one of malignancy. The transformation may go further and become a pneumococcus. If we have in these infections a streptococcus of this type and that same organism by animal passage may become a hemolytic, or a pneumococcus, it is a matter of tremendous significance. More than that, in Dr. Rosenow's work he has shown conclusively that the streptococcus viridans is the organism of malignant endocarditis; that the streptococcus viridans, for the most part, is the organism which produces so-called rheumatic arthritis. We have in these jaw infections, therefore the makings of serious and far reaching lesions.

Dr. Rosenow has inoculated animals with the streptococcus viridans and by changing the virulence has produced hemorrhages in the mucosa of the stomach and duodenum which hemorrhages have broken down and formed ulcers. It is rather a serious thing that an ulcer of the stomach or duodenum may follow an infection higher up in the tract. Dr. Rosenow has produced time and again in a long series of experiments definite petechial hemorrhages into the mucosa of the duodenum and stomach which later broke down and formed typical gastric ulcers and duodenal ulcers. The same streptococcus viridans will produce malignant or ulcerative endocarditis a fatal disease in most every instance.

The work of Bunting and Yates is likewise very important. They have pointed out a certain diphtheroid bacillus as probably the cause of pseudoleukemia or Hodgkin's disease, and we are finding a good many of these pseudo diphtheroid bacilli in the bone cavities, about the jaw. We have two patients at the Presbyterian Hospital with Hodgkin's disease in which this organism was isolated in pure cultures from cavities in the jaw. The other day

a young officer of the navy came in with a chronic alveolar abscess of a lower second molar, with a fistula discharging under the jaw, suffering from a typical pseudolukemia. By making most careful inoculations, putting sterile tampons up into the fistula, we obtained a pure culture of the organism. The organism was also found in the root canals after the tooth was removed. Following the manipulations of extracting the tooth and putting the tampons up into the fistula, the next day there was an acute exacerbation with definite enlargement of the spleen, and rise of temperature. The tooth had never been treated.

As to whether it will prove to be true that this diphtheroid bacillus, is the definite etiological factor of Hodgkin's disease, is of course a question, but it looks like it. Three cases of Hodgkin's disease have come under my observation in the last six months in which this new organism was found in pure culture in the jaw in what appeared to be insignificant alveolar abscesses.

Dr. Gilmer has pointed out another important thing, that in those cases in which we have a liquefaction and peptonizing of the tissues around the roots produced by saprophytes, certain toxins are formed. Now, the toxine molecule may pass out through the membrane formed at the apex, while the anti-body molecule may not pass into the sac to neutralize the toxins because of the larger size of the former.

In a word, the bacteriology of chronic infections about the jaws has come to be a matter of first importance.

Lastly, I want to thank Dr. Gilmer on behalf of the program committee for this very splendid paper.

DR. A. M. MOODY:

I have very few words to say in regard to the bacteriology except this, that there are three points of interest: 1. The method of collection of the material is of importance. 2. The media upon which the bacteria must be grown. 3. The method of growing the bacteria. The bacteria should not only be grown aerobically but anaerobically. That is done easily by the method described. The method of collecting material is simple, using precautions to prevent contamination from other organisms in the mouth by the proper sterilization of the surrounding tissues and using sterile glass pipettes to draw up the infected material.

Another point that I may add in connection with the remarks made by Dr. Moorehead is this: In one of the cases that I examined for Dr. Gilmer we found a pseudodiphtheria organism. This organism in a great many respects was similar to the organisms which have been isolated from the glands of pseudoleukemic cases.

DR. GILMER (closing the discussion):

I do not know what I can say except to thank the gentlemen who have discussed my paper for the very kind things they have said about it. I wish especially to thank Dr. Lyons for coming so far to open the discussion.

REPORT OF THE PUBLIC SERVICE COMMITTEE OF THE CHICAGO DENTAL SOCIETIES.

BY DR. C. N. JOHNSON, CHAIRMAN.

It has been my privilege on several occasions to come before this society to report on the progress of the work undertaken by the public service commission.

Tonight I want to review briefly the movement to date and to make an announcement which I feel sure will receive the endorsement of this entire society.

The first clinic established in our public schools was under the auspices of the Odontological Society of Chicago, largely through the efforts of Dr. Brophy. This was established at the 93rd Street School in 1910. The equipment for that was donated by some of the dental supply houses. Shortly after that the Chicago Dental society appointed a commission to cooperate with a committee of the Odontological Society and to extend this work. Sufficient funds were raised for the equipment of three other infirmaries, making four equipments in all. These funds were raised by private contributions principally through the efforts of Dr. H. H. Schuhmann and myself. We had four equipments, maintaining three infirmaries with a double equipment in one. This work was all performed by voluntary service on the part of members of this society, and I want tonight to thank those men who stood

by this work at that time which, as I look back over it now, was a critical time so far as this movement was concerned in Chicago. I was made chairman of the commission and had charge of this work in conjunction with Dr. F. F. Molt, who had in the meantime been made the dental member of the Department of Health of Chicago. As I have said we had three infirmaries running, and I then opposed any further extension of this work. I did that for the reason that I felt in viewing the situation that there was some jeopardy in attempting to maintain work of this kind on a permanent basis by voluntary service alone. I felt we were demanding a great deal of these young men who were giving time to this work. The time must inevitably come when they would grow tired of it in the natural order of things, and while a great deal of pressure was brought upon me to extend the work, I absolutely refused sanction of the equipment of any more infirmaries, and I am much afraid that at this time I tried the patience of some of my good friends. I imagine they thought I was an obstructionist; but I believe I was wise in that move, and I do not believe it would have been possible to have maintained any more infirmaries at that time on voluntary service alone. I am not quite certain of the exact date of the Englewood Clinic. This Clinic was started under the auspices of the Englewood Dental Society in connection with the United Charities of Chicago. I believe that the valiant men who took charge of that work experienced some difficulty; they experienced the same difficulty I had seen in our work, that it was difficult to maintain any movement of that kind on voluntary service.

I want to acknowledge that at that particular time, though we had no intention of giving up, there were a great many dark days. At that juncture Mr. Julius Rosenwald, at the solicitation of Dr. Schuhmann, entered into the movement, and I want to pay tribute to the name of that man tonight. He, after investigation, voluntarily equipped six additional infirmaries, making ten in all, and promised to maintain them on a salary basis of \$10,000 a year until such time as the city should be induced to take over this work. That placed it on a different basis from any other city with which I am familiar. Dr. Molt took charge of the Clinics in parts of the city where they were most needed. The supplies

have been obtained in any way we could obtain them, but we have been favored by the generosity of the dental supply people, by the magnificent generosity of men connected with the movement, such men as Mr. Rufus C. Dawes, Treasurer of the Commission. When you hear the names of Julius Rosenwald or Rufus C. Dawes, if you are a dentist, take off your hat if it is twenty below zero. Mr. Rosenwald has maintained the Clinics up to this time. We have had ten operators in the infirmaries, five women and five men, and I want to have the ladies take this solace home that the services of the five ladies have been eminently satisfactory. I believe the woman dentist is the typical dentist for this kind of work. The men operating in these infirmaries have done valiant service, but I do believe the women are more suitable for this work than the men, particularly in dealing with the children.

The idea was that this movement was simply temporary, with the firm conviction that private citizens, who were bearing the burden in the maintainance of the work, should be relieved of that burden, and this matter should properly go to the city where it belonged. To that end we have been laboring with the proper committees of the City Council to see if they could be induced to take the work over. From the start we have had the cooperation of the Department of Health. When Dr. Evans was health commissioner he was greatly in favor of the movement. It was through his influence that a dental member was appointed as a regular member of the Department of Health, and when the present Commissioner, Dr. Young, took charge of the office he assumed the same cordial relations. In making up the last budget the Commissioner of Health placed in that budget provision for the maintenance of these ten infirmaries. I can assure you we have watched the action of the council committee with a great deal of concern, and one morning when the papers came out and told us that various things had been cut right and left, my heart went down clear below my diaphragm; but before night I was called on the phone and was informed that the City Council had passed the budget and was going to take over the ten infirmaries and maintain them by the city. (Applause.) I believe that to be one of the most significant moves made in the City of Chicago so far as the recognition of the value of oral hygiene is concerned, not only

to the individual but to the community itself. Those members of the Council Committee who passed the appropriation did something more far-reaching than they ever dreamed of; they placed the care of the children's teeth on a basis I believe more comprehensive in its results than that of any other city with which I am familiar. This is no reflection on the Forsyth Institute in Boston, but these infirmaries scattered over the city in different sections will meet a greater demand for the particular kind of people who require that service than the Forsyth Infirmary.

I wish to express my appreciation to all those who have given us their support in this work. Every one has aided to the utmost of his ability. I want especially to mention Dr. Gethro and Dr. Black who have assisted me in this work very materially. Dr. Molt has stood by his guns always. Every member of the Commission has done good work, and I feel like congratulating the Society on what has been accomplished. Furthermore, I want to thank the dental supply houses who have assisted us and to express my particular appreciation of the assistance of Mr. Rosenwald and Mr. Dawes, and I also want to mention the name of one man whom I have never mentioned before who has helped me considerably; and that is Colonel George Fabyan. He has rendered valuable service in this movement, and I do not see how we could have gotten along without him.

Lastly, Mr. President, I want to say that I am deeply appreciative of all that has been done in this movement to place oral hygiene where it is, and I believe Chicago has made a record that it will never be ashamed of. (Applause.)

ODONTOLOGICAL SOCIETY OF CHICAGO.

A regular meeting was held February 10, 1914, with the President, DR. L. L. DAVIS, in the Chair.

DR. E. A. ROYCE EXHIBITED A NEW FORM OF CLASP FOR PARTIAL DENTURES AND DESCRIBED IT AS FOLLOWS:

DR. E. A. ROYCE:

As you all know, I have been very much interested in partial dentures for movable bridges, and particularly in the presenta-

tion of Dr. Roach's double bow clasp some time ago. I attempted to use it in my practice, and I have found it exceedingly useful in the positions in which Dr. Roach recommended it.

Here is a specimen that I have been experimenting with. Anything that requires more of a clasp on the tooth, with an extension wire far enough to come around the tooth and go in and grasp on the side of the tooth, reduces the strength greatly as you go back to the turn unless you use heavy wire and make it quite a heavy affair. In many cases we find that we want the clasp to grasp around the tooth to prevent it from moving forward.

For some time I have been experimenting with clasps and I think I have hit upon something that has helped me out in the way of a clasp for a case like this and for some other things. This is one of my experimental cases. The principle is to get something that will spring close in under the bell of the crown the same as that double bow. In order to do that, I have made my clasp similar to any clasp and have taken a saw, after the clasp is formed, and made a slit to leave the two ends free. The one next the gum may be sprung tightly into place wherever we want it, and will move with the same elasticity as the double bow clasp. I have used it in a number of cases, and I am satisfied with it.

I intended to elaborate upon the manufacture of this clasp and make a paper on the subject for some future meeting. This little device is intended to be exhibited and demonstrated at the big clinic which is to be held here, but I wanted to present it to the Odontological Society of Chicago first, and that is the reason I brought it down.

DR. F. E. ROACH:

I would like to present a little further extension of this double bow clasp to this society for the reason that I expect to show this at the 50th Anniversary of the Chicago Dental Society, and I want to have the privilege of showing it at this time. It is a new clasp for the cuspid tooth or teeth, where the teeth are all out back of the cuspid. I believe I have solved the problem of clasping the cuspid teeth which will hold dentures.

The principle of this is a continuous ring which extends between the contact, running over the contact of one cuspid and the

adjacent tooth. I cut a nich in it and it goes down between the teeth, loops over, and I turn it at right angles around the tooth at that point, and it will grip the whole contour of the tooth at that depression, and when it is fastened it cannot give. I have tried it in but two cases in the mouth and it has worked satisfactorily. It is a simple thing. It is soldered to the gold plate or vulcanized in the vulcanite case. It is inconspicuous and very strong because it has a continuous loop. It will work just as well in the upper as in the lower teeth.

DR. J. H. WOOLLEY read a paper entitled "The Possibility of Systemic Diseases Arising in the Dental Tubules."

DISCUSSION.

DR. C. N. JOHNSON:

I think the Odontological Society is indebted to Dr. Woolley for presenting this subject. It is high time that this subject was brought before the profession once more. Ever since Dr. Woolley has been reading papers before dental societies, he has been intensely interested in this particular subject. He called our attention to it many years ago, namely, as to the possibility of systemic diseases arising from infection through neglected dental tubuli.

As he has stated in the paper, the medical profession are awakening to the possibility of systemic disease through dental irritation. I do not know whether Dr. Woolley has it in his paper or not, but he mentioned verbally the exhibition of X-ray pictures of filled pulp canals, that is, the roots of pulpless teeth, and has mentioned a fact which I believe to be a significant one, that many of these pulp canals which the X-ray shows to be well filled have had abscesses on them. That raises in my mind the question whether or not we have not been making mistakes in reading too broadly the evidence presented by the X-ray. The exhibition before this society some years ago of X-ray pictures of pulpless teeth would seem to indicate that very few of these pulp canals had been properly filled, and yet we know this that relatively to the number of teeth that are pulpless and the roots of which are filled to the number of abscesses we see following that operation, there is either one of two things. Those pulp canals are better filled than the X-ray shows or that the teeth do not abscess so frequently after filling as we have been led to

believe, because there are relatively, I believe, today very few abscesses following the filling of pulp canals in the hands of careful operators, and it is inconceivable with the variations in the canals as we find them in daily practice, that with our limitations we can always fill pulp canals well to the end of the root.

The question arises as to what happens in these tubuli when the pulp canals are not well filled. I hardly feel that there is the danger that Dr. Woolley has pointed out. I do not believe we are yet in a position to say what the contents of these tubuli are from a pathologic standpoint. I do not know just how much of an effect there would be upon the pericemental membrane following teeth treated in the way Dr. Wooley has intimated. He argues in favor of drying pulp canals very thoroughly with the root canal drier. For some reason I am not very partial to that kind of treatment. I tried it in former times with the root canal drier, and heated it and placed it in the canal, and I would get a sizzling, and I would continue that, but whenever I have placed the hot root canal drier in the canal it caused a sizzling that I have not been able to control. What happens when you forcibly dry out a canal in that way? I am afraid that the too extended use of that hot root canal dryer will lead to as much harm as good. In drying these canals and the dentin around these canals I believe there is danger of drying them too much. In the treatment of these cases, I believe if we will use some treatment like absolute alcohol and evaporate that reasonably, not keep up the evaporation too long, we will leave that tooth in a better condition for filling, and it will remain more comfortable than it will if we continue the drying process too long.

DR. WOOLLEY:

What do you mean by the expression too long?

DR. JOHNSON:

Until we are absolutely certain that it is so thoroughly dry that we will not get any response from the root canal drier.

DR. WOOLLEY:

You say you have not been able to control that sizzling?

DR. JOHNSON:

In no case where I have used the root canal drier and ob-

tained a distinct sizzling have I felt safe in eliminating that sizzling by repeated application of the hot root canal drier.

DR. WOOLLEY:

From the apical foramen?

DR. JOHNSON:

Yes, from the apical foramen; wherever I get a sizzling I have not been able to control it.

DR. WOOLLEY:

Do you mean in ordinary cases?

DR. JOHNSON:

Yes, in ordinary cases. I do feel this, however, that we cannot lay too much stress upon the possibility of infection in the canals which have been open for a long time to the fluids of the mouth. I believe in those cases we should treat them with some medicament, probably that will control the diseased condition, and treat them sufficiently long and keep them sealed with that treatment in sufficiently long, so that we may be as certain as possible that the dentin has been thoroughly disinfected.

The subject of dental irritation following root canal work has appealed to me more particularly since we have had papers before various societies from medical men pointing to systemic conditions from dental irritation. It is a subject that cannot be emphasized too much, because the average man in the profession does not make an honest effort to get the canals in good condition, but I believe that there is as much danger of damage from overtreatment and over-medication and over manipulation as there is from undertreatment and undermanipulation, and so the great danger in papers like this going out to the profession and in publishing the skiagraphs of these cases is that the men who will look at the skiagraphs or read the paper will feel it incumbent upon them to get to the end of each root, and I believe in their attempt to do that they will sometimes cause irritation at the end of the roots which is much worse than the case was before they took hold of it. I feel the effort we make sometimes to reach the ends of the roots or to be sure that our root canal filling has reached the end is in some cases more damaging than we have any idea of, resulting in abscesses where the skiagraphs show the roots are perfectly filled. We are operating on

delicate tissue when we go up into the canal of a tooth, and when we emphasize the doctrine without caution that we should fill these canals thoroughly to the end, many young men are being led astray. It is possible to teach young men how to manipulate and how to do mechanical work, but you cannot put judgment into their brains. While I want to caution men about getting into the canals as well as they can and have some conscience in cleaning out the contents of the canals, I believe on the other hand we have preached so much along this line that we are causing many young men to fill beyond the roots of the teeth and thereby producing abscesses simply through injudicious jamming of root canal fillings beyond the point where they should go.

DR. ELLIOTT R. CARPENTER:

I have enjoyed Dr. Woolley's paper very much. It is timely. There is one part of his paper which I fear I misunderstood, but if I did understand him correctly I must take issue with him. He commented upon the possible systematic lesions and the carrying off of putrescent matter from the dentinal canal, and as I understand his way of wording it, it was through the cementum. Am I correct, Dr. Woolley?

DR. WOOLLEY:

Yes.

DR. CARPENTER:

My understanding is the cementum is a tissue through which you cannot carry products. It does not permit of osmosis, so that infection from the dental tubuli must be through the apical foramen.

In regard to moisture in the dentinal tubuli, I believe a certain amount of residual moisture is necessary. I am sorry it is necessary for me to take issue with Dr. Woolley in regard to the absolute dehydration of dental tubuli by means of the root drier. I believe it destroys the strength of the root, and there is a possibility of setting up apical inflammation. Personally, I believe Dr. Johnson is correct in the statement that roots are overtreated and they are overfilled. Where a root canal is so small that you cannot get into it with the finest broach and reach the apical foramen, or cannot do so with the finest broach and sulphuric acid, I do not think it is necessary to bother very much about closing the apical

foramen, and that Nature has already closed it in most cases. Personally, my own technic in regard to the drying out of root canals when I believe they have been made aseptic is to make use of a very small jeweler's reamer, with the temper drawn, which I wrap with a fine wisp of cotton, maybe a dozen fibers, and put it as far as I can into the canal. With a twisting movement of the broach, armed with cotton, I wipe it until I cannot see any moisture on the cotton with the aid of a magnifying glass or by drawing it across the rubber dam I cannot trace any streak of moisture. I think in this way you have accomplished all the dehydration you need.

DR. W. V-B. AMES:

I have been much interested in Dr. Woolley's presentation of this subject, because it has been thorough from his standpoint, and I am not ready to question that his standpoint is not correct as far as it goes. Thorough drying by heat sounds good. The next stage after root canal drying is the root filling, which must not only fill the canal just far enough, but must be a sterile or sterilizing material. An X-ray showing apparently an entire root filling does not insure a sterile filling.

My dental anatomy is not as fresh in my mind as it should be, and I am not sure whether it is now recognized by histologists that there is any anastomosis of the dentinal tubuli and the canaliculi of the cementum, but we have all seen more than one foramen to a root and such can be seen well away from the apex and of good size. It is perfectly easy to overlook these in the ordinary examination and cleaning of the root canal. We have all extracted teeth where there was a sac of pus, one or more places upon the root other than at the apex. There are possibilities which make it entirely reasonable that this might result from infected tubuli, if they anastomose with the canaliculi of the cementum.

I do not believe the perfect root filling has been introduced by any means, that is, a filling which will obviate the possibility of the condition taking place which Dr. Woolley wishes to avoid. I question whether the kinds or compounds or admixtures of gutta percha so often used, are in any way the ideal material for the purpose. I believe that oxychlorid of zinc, properly used, is the best root filling ever advocated, if it can be properly mixed and

inserted as far as you are apt to get a root filling. With this you will come near having a sterile condition in the tubuli. If you have lateral foramina you come nearer having them taken care of with oxychlorid of zinc as a root filling material than a good many of the materials that are used, and especially a solution of gutta percha in chloroform.

DR. JOHNSON:

Would you object in using oxychlorid of zinc to having fine fibers of cotton incorporated with it to carry it up into the root canal?

DR. AMES:

I do not think I would from what I think that I know of the nature of cotton. Raw cotton is not of itself absorbent. If used to assist in carrying the oxychlorid, and it is entirely enveloped, a little *raw* cotton ought to be admissible.

Years ago I found that if I removed the bulbous part of the pulp of a third molar, with mere thread-like canals remaining, I could use chlorid of zinc mixed with oxid of copper, getting oxychlorid of copper which inserted only a little way into the canal would outline the canal and all organic matter with stain. Anything left there would be a dark greenish blackish material so impregnated and mummified I had reason to believe by this particular mixture, that I am morally certain there was never a tendency to the infection of tissues beyond the root.

After the desiccation advocated by Dr. Woolley, oxychlorid of zinc has been found serviceable. Some other cements with more positive embalming properties ought to be better. It happens that my subject next month is to be along the line of sterilizing filling materials. I am moved by the paper tonight to take root filling into consideration.

DR. TRUMAN W. BROPHY:

I appreciate as fully, I think, as anyone can the effort that is being made by Dr. Woolley along the lines he has discussed this evening, and, like my colleagues, I wish to express my appreciation of the work he has done.

It seems a little strange that through the centuries, up to within the last decade, I may say, or perhaps even less time, so important a subject as oral infections of dental origin should have been over-

looked by the members of the medical profession. Today medical men, I think, are more keenly interested in this subject than any other that is before them, quite likely due to the fact that it is to them a comparatively new subject. If they had thought about it, they said nothing, and so almost within the period of five years eminent medical men of our country and of other countries have been interested in this subject of infections or general infections resulting from lesions within the oral cavity. Why they should have overlooked this great field so long it is difficult to comprehend. In any event, since the work of oral prophylaxis has claimed so much attention and so much is being done in that line, medical men have taken hold of the subject. Once they have looked into it a little and understand as they should understand, that lesions of the teeth are so numerous, and that infections of the mouth have been manifested in all sorts of maladies, they have become intensely interested.

Dr. Woolley has taken up a new phase of the subject, general diseases as the result of infections of the dental tubuli. Whether the dental tubuli, after a pulp canal has been sealed by filling, can bring about infection of the parts surrounding it or those quite remote, is a question. The contents of the pulp chamber when diseased necessarily involve the contents of the tubuli, and the contents of the tubuli together with the tooth pulp would involve the pericementum and then indirectly the parts surrounding it. So to get at the subject of the paper and confine one's self to it, is a rather difficult matter. I cannot conceive how dental tubuli, independent of the dental pulp, can produce an infection. We know that in some cases, and these are according to histologists comparatively rare, the tubuli have direct communication with the lacunae or canaliculi of the cementum. It has been stated that if these conditions do occur they are extremely rare. I have seen some cases where colored fluids have been forced into the pulp canal and out through into the cementum. I have seen this in one or two cases where several hundred cases were tried. This was done in a laboratory in Philadelphia, but it occurs so rarely that I hardly think it is worth while to say that it occurs at all. If we get infection from the dental tubuli it must be through the

tooth pulp and from the tooth pulp through the pericementum and from the pericementum through all other tissues. I suppose Dr. Woolley intended to mean that infections of the tubuli necessarily involved the tooth pulp and then the surrounding parts became infected. However, the trend of the paper is to show that these infections are serious, and that they may well claim the attention of medical men, and that we are alert upon this subject. We feel that more attention should be given to the subject of general infections of dental origin, as they are worthy of our attention and time and our efforts in assisting Dr. Woolley in the presentation of his matter in the form of discussion.

What the outcome finally of this work will be is a little difficult to tell. Just recently I had occasion to write to procure the work of Dr. Upson, of Cleveland, on the subject of general infections of oral origin. I wrote to Dr. Ebersole and asked him if he could get Dr. Upson's writings. He wrote me that Dr. Upson died last September and that if it is possible for him to get his writings he would do so.

Dr. Upson, of Cleveland, was one of the first to come out and to absolutely startle the medical world by his declaration that general infections of oral origin might produce something like 125 different maladies of the human body. His utterance was received in some circles with derision; in others with a spirit of seriousness, and in still others again quite lightly, but the impression that that man made on the medical profession in awakening interest in this subject led to a broad discussion of it everywhere, and today it is recognized as one of the most important subjects before the medical profession. When the most eminent medical men will spend their evenings in a discussion of the subject before medical societies it means a great deal.

In my experience in surgery of the mouth I am constantly meeting diseases of the surrounding parts of dental origin, and I know that people are constantly suffering from a want of knowledge of the importance of observing the laws of hygiene.

If I were able to do so, I would like to give Dr. Woolley all possible encouragement in his work. I would like to do something in some way to help him in his work. I would like to carry to the medical and dental professions everywhere a message to the

effect that this is one of the most important subjects in the medical and dental world today; that its solution in the employment of means to prevent the prevalence of diseases which are so general and which are working such destruction to the human family, is worthy of the efforts of the very best of men.

DR. CARL D. LUCAS:

I was very much interested in Dr. Woolley's paper and have enjoyed it in every sense of the word.

When I began the practice of dentistry the subjects which interested me more than any other in dental routine were those which dealt with infections of the mouth and tissues upon which the dentist is called to operate, and the sequellae which result from such infections in other organs of the body.

As Dr. Johnson and others have said, Dr. Woolley's paper will undoubtedly stimulate the younger men of the profession to very zealous work with reference to the opening of all pulp canals to the apical foramina, if possible, which is indeed possible in most cases, and the ultimate filling of those canals to the ends of the roots.

In the teaching which I am doing in the Indiana Dental College, I am continuously coaching the members of the Freshman class to get all of the work they can possibly do in canal treatments when they enter the infirmary. It was the custom when I was a student for some of the boys to shift the responsibility of that sort of operative dentistry to other members of the class. The things they seemed to be more interested in were the technical operations of restoring organs which had already been lost. That unquestionably is the wrong attitude to take. The conservation of organs which are present is the primal function of the dentist. This is the trend of the dental profession of today. Preventive dentistry; a branch and the most important specialty of the medical profession.

Dr. Woolley mentioned the number of X-ray films which he has which show faulty technique of the filling of pulp canals and if you will pardon me I will cite one case which was brought very vividly to my attention just before I came to Chicago.

A patient presented with an abscess at a point on the gum directly opposite the bifurcation of the roots of the lower right

first molar. She had previously had the tooth treated several times and was anxious for its conservation. I advised her to have a radiograph made, which she did. The radiographer, who is quite an expert, gave his opinion that the canals were filled to the apical end. I opened the pulp canals to a point about one millimeter below the bifurcation of the roots. Up to that point the canals were filled with cement. After passing that point the broach dropped into the canals into a soapy fluid, which I suspect was some of the proprietary preparations sold for filling roots and which are inefficient as such fillings. I do not know what it was, but the canals were certainly not filled with a solid substance. That is only one of the many cases which has brought to my attention in the last few years the fact that we cannot rely upon X-ray in every instance.

There is one point in technique with reference to the treatment of pulp canals which I learned on a trip to New Orleans, a point I consider well worth the expense of the trip a great many times over. It had been my custom to dry pulp canals by twisting cotton fiber upon a spiral broach. Occasionally it was almost impossible to get the cotton off of the broach, consequently I lost much time. I tried many times to use a smooth broach as an applicator for medicaments, by twisting cotton upon the broach, but I could not get it to hold. For instance, when I wished to apply a drug in the canals and pump it down towards the ends of the roots the cotton would become loosened. It is an easy matter to attach cotton to a smooth broach and all there is to it is to draw the smooth broach across a piece of sterile beeswax before twisting the fiber upon the broach. Any amount of cotton may be firmly attached to the broach and it will not become loosened in pumping the drug into the canals. That little point in technique has saved many hours of time for me. It has materially assisted me in drying canals because I am enabled to use a smooth broach of extremely small diameter and twist a few, or as many fibers as necessary, upon it, and come more nearly approaching the apex of the roots with the dry cotton fibers in drying the canals than by any other method.

Dr. Johnson spoke about the electric root canal dryer, which he said produced a sizzling sound when he introduced it into the canal, therefore it was impossible for him to dry the canal with an

electric canal dryer. If he gets that phenomenon when he first introduces the electric root dryer, it is evident to me that the canal should have been dried out with cotton fiber previous to the introduction of the electric dryer. There should be no trace of moisture upon the cotton fiber before he applies the electric canal dryer. In that event I do not see how it could draw enough moisture from the dentin to produce a sizzling sound.

My understanding of the histology of a tooth root is that the dental tubuli which run through to the cementum terminate under the cementum by branching and the cementum of the root is deposited in lamellae over the ends of these branch tubuli. These layers are held together by cementum fibers which run through the canaliculi of the cementum from the lacunae. Between the peripheral dentin and the superimposed cementum there is a layer of homogenous calcified structure which is nonvascular, therefore the cementum is impenetrable to even stains which may be injected under pressure in the pulp canal. The tubuli of dentin by dividing before they reach the cementum are very minute and they terminate in the granular layer of Tomes. From the point of division these tubuli are much more minute than they are at the beginning at the odontoblastic layer, or surface cells of the pulp. I am quite sure there is no direct communication between the tubules through the cementum to the pericemental membrane. My understanding is that the pulp nourishes the dentin of the tooth root through its substance to its periphery; that the pericemental membrane nourishes the cementum of the tooth root through to the dentin.

Therefore, if a pulp canal is filled to the apical foramen I do not see how it could be possible to get an infection of a pericemental membrane from the tubuli through the cementum of the root.

There is one point in the histology of pulp tissue which I am working upon now and that is with reference to the demonstration of lymphatic circulation in the pulps of teeth. Dr. Noyes in his book makes the statement that all authorities are agreed that there is no lymphatic circulation in the pulp. In the last edition of Pier-sol's Histology, he says lymphatics have been demonstrated in the pulps of the teeth. I spoke to Dr. Noyes the other day about this matter and he replied: "I do not say positively that the pulp does not have lymphatic circulation, but all authorities claim that this is

the case." When I read in Piersol's Histology that the pulp has lymphatic circulation, it appealed to me very strongly and I went before my class and told them it had been demonstrated that the pulp does have lymphatic circulation and I was very much elated over it. One of the members of the class said: "What do we care about that?" After I was sufficiently recovered from this mental shock I explained to the class the importance of lymphatic circulation in conservation of pulps which have been irritated. This question is one which I am going to work out in my histological laboratory work and I am going to demonstrate lymphatic vessels in the pulps of teeth if they are present. It is contended that the resulting toxins from pulpal irritation percolate through the end of the root coming from between the cells of the pulp through their intercellular substance and thereby are eliminated. I am hoping someone will definitely demonstrate lymphatic circulation in pulp tissue. It is a question which interests me very much, because I advocate pulp capping.

Dr. Woolley's paper is indeed very timely because it strikes at a very pertinent point of preventive dentistry and any subject which deals with prevention of dental lesions is of the utmost importance. These subjects should be presented before the medical and dental professions for discussion.

In the last thirty days I have heard four papers upon oral sepsis. I have heard two in two days. Two papers were by medical men and two by dentists. We are on the right track.

DR. J. G. REID:

There is a whole lot of material in the paper that can be criticized, and some things that cannot be criticized. I do not think we know all yet about the teeth that should be learned. We have progressed very rapidly in the last two years in finding out things, but we have a whole lot to find out yet, and the longer I practice dentistry the more I realize that very fact. Once I thought I knew something about the dental tubuli, and there are so many things that come up in practice from day to day, from month to month, and year to year, that they really bewilder me. It makes me think that man does not know very much after all. I do think teeth are overtreated, for one thing. That is one basic proposition to start out with. There is a great tendency to overtreat teeth and

more damage than good is done many times. I make that statement from my own experience.

I read a paper a great many years ago before this society on the treatment of pulpless teeth, and I see no reason for changing the views I advanced at that time.

I discarded the root canal drier a great many years ago. I tried it faithfully, and I thought it was an ideal thing when I began its use. I thought really we had solved the problem, but finally had to discard it because I did not think I was able to dry the root with it. I believe it is an utter impossibility to dry out a root canal, although that may be a broad statement to make. I do not believe even with what moisture we leave there that it has to be considered in connection with the pathologic conditions that may arise from that process. I do not believe that we have any of the difficulties with the dental tubuli causing any trouble, but the trouble we get is from false foramina that may be in the teeth, or we get it through the original channel at the apical end of the root. When trouble arises it is easy to understand why we have these difficulties. It is largely because we have not cleared the canals of the animal tissue within them, and we cannot always do it. Nature favors us in our troubles and in our treatments of pulp canals, and a wise provision on the part of Nature has been made to overcome some of these conditions.

I believe teeth become encysted. Dr. Harlan advanced that theory a great many years ago, and I believe he was right. We find very many times teeth in which the pulp has been dead for years and have never given any trouble—teeth that we know are imperfect in our own hands as well as in those of others. I believe I can fill a root canal as well as any other living man, I do not care who he is, but I cannot fill all of them, and I have trouble the same as anybody else. We do not resort to sufficient instrumentation of the canals as we should do. I do not believe canals ought to be reamed out. I believe the canal should be left as Nature left it, or as near as possible, and fill in that condition as near as we can without disturbing it mechanically except to get as much animal matter out as possible, and then fill it.

DR. F. E. ROACH:

I feel that Dr. Woolley is about half right, and I do not know

but what he is wholly right in the position he has taken in this matter. I have the greatest admiration for him, because he has had the dogged determination to win out in the desiccation of root canal treatment. One of the first things I learned in dentistry was with reference to Dr. Woolley's desiccation of root canals. When I was in college he told a body of students how to disiccate root canals and fill them. What he said at that time made a deep impression upon me. I took up the method, tried it, and dropped it. I took it up again and dropped it, and took it up again, and I cannot get away from the idea but what it is a good thing, for the reason that it is an aid to the mechanical closing or sealing of the canal. You know that if you thoroughly dry out or remove all animal or pulp tissue mechanically and then desiccate the canal, it is a very much easier matter to get filling material into the canal and practically seal those tubules. Chloro-percha is not the thing to fill them with because you cannot mechanically seal it with that material. It is a physical impossibility for the reason that in the chloro-percha the chloroform evaporates and you have a shrinkage. Shrinkage takes place by the evaporation of the chloroform, and the material is drawn away from the walls of the canals, therefore producing an imperfect root filling.

I was very much pleased at the remark Dr. Lucas made with reference to the infallibility of the X-ray as a means of diagnosis. It is misleading, in that the skiagraph may show from all indications that the canal has been properly filled to the apex, and yet the space existing around the canal and the walls of the cavity may be considerable, and that will not show in the skiagraph at all. If you depend upon the X-ray to determine whether the canal is filled or not and say it is all right, and do nothing with it, you will get badly fooled in many instances.

I want to lend my support to Dr. Woolley in this matter. I believe he has something that is, from a mechanical standpoint, worthy of our consideration. I believe that we can by desiccation practically and more perfectly fill these canals. These large canals are the ones in which abscesses occur more often than in any other. The small, tortuous canals, the ones we cannot get into and seal practically; we do not have abscesses on these as we do on the

others. We have more abscesses on those we think we have filled than on those we do not attempt to fill.

DR. L. L. DAVIS:

When Dr. Woolley introduced the root canal drier, many, many years ago (I think it was in 1891), I began its use at that time, and while I have not used it continuously since, I have found, since the advent of the devitalization of pulps by the use of cocain that I use the root canal drier more often than I ever did, and I find that by the use of the hot instrument you can go down into those root canals, dry up the fragments, and by that means you can remove fragments that you could not do in any other way. The heat of the instrument destroys all sensation of the tissue and you can clean up the cavity a great deal more readily than you can in any other way.

As regards the theory of infection from the tubuli, it is one for him to prove or for someone else to take up that line of work and follow it out to its logical conclusion and prove either its fallacy or its truth.

I certainly appreciate Dr. Woolley's paper and personally thank him for it.

DR. WOOLLEY (closing):

To avoid the dangers in filling pulp canals such as has been spoken of by Dr. Johnson, a suggestion might be made as regards the instrumentation. There are certain conditions to observe in root filling which neglected aborts the end in view.

A sense of pressure noted by the patient will determine whether the filling has reached the apical foramen (which must be by a slight sensation of pressure), but we must also be able to determine whether this pressure is from the filling or air. First, apply the rubber dam and desiccate the root canals. Second, Flood the pulp canal with chloroform and by the movement of the broach back and forth in the canal air bubbles will escape. Afterwards work chloro-percha in the canal. A new danger arises here, i. e., in the act of removing the broach, air will rush into the pulp canal. This can be avoided by seizing the broach with pliers and drawing the broach slowly out, leaving gutta-percha in its place. Then follow

with the gutta-percha point, forcing the latter gently till a slight pressure is noted.

I will not discuss the matter of the dental tubules and their care, as the discussion's trend seemed to be in regard to filling pulp canals, but I do wish the profession would make some research and study of the dental tubules. The tubules being microscopic in character, as I said are not considered to play any important part from a pathological point of view.



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EDITORIAL.

THE CROWNING EVENT OF THE ILLINOIS STATE DENTAL SOCIETY.

On March 23-26, 1914, there was held the fiftieth anniversary of the Illinois State Dental Society at the Hotel LaSalle, Chicago, and it turned out to be a record-breaking meeting in every way. In the first place the attendance was away beyond any other dental meeting which ever convened. The registration ran over 4,300, and the various estimates of dental supply houses, and others in a position to observe, placed the number in attendance who did not register as high as 1,500. It is conservative to state therefore that the attendance exceeded 5,500.

The arrangements were perfect, and everything went off as per schedule. Monday, 23, was International Day on which occasion clinics were given by representative men from nearly every state in the Union outside of Illinois besides those from Canada and other countries. In all there were on that day 163 clinics. In the evening papers were read on Operative Dentistry by Drs. Edwin T. Darby and Edward C. Kirk of Philadelphia, which were discussed by Dr. H. E. Friesell and others. Tuesday was Illinois Day—being devoted to Clinics by Illinois men only. The arrangements for this clinic were unique. There were fourteen clinical sections with from fifteen to eighteen men in each section, making more than two hundred clinicians. The audiences were seated at tables in different rooms, fifteen tables in each room accommodating ten or twelve at each table. There were fifteen duplicate models of each clinic and the clinical sections passed



ILLINOIS STATE DENTAL SOCIETY
 GRAND ANNUAL
 BANQUET

1904-1905
 Hotel Madison Park Chicago

Main Banquet Hall, Fiftieth Anniversary of the Illinois State Dental Society.

from one room to another in regular order. As the section entered a room one clinician seated himself at each table with a set of the models and as the chairman of the section read a description of the clinic to the entire room the seated clinicians exhibited the models. This was repeated in every room so that all that was necessary for a visitor to do in order to see every clinic perfectly was to seat himself at one of the tables and have each clinic in turn brought to him and fully described. The immense amount of work necessary to organize, prepare and successfully carry out this clinic will never be known to any except those who took part in it. Imagine for instance fifteen duplicates of the most recent crown work, or bridge work, or partial dentures or splints for broken jaws, etc. In gold inlay work alone it was necessary to cut nearly one hundred cavities and carve as many wax models and invest and cast as many gold inlays.

But the work was all completed and ready for exhibition by each section on the morning of Illinois Day, and the general verdict of those in attendance was that it was a great success.

On Tuesday evening a paper was read by Dr. A. W. Thornton of McGill University, Montreal, Canada, on "Modern Crown and Bridgework." This paper was discussed by Dr. J. Leon Williams and others.

On Wednesday morning there were two papers on the "History of the Illinois State Dental Society" by Drs. Edmund Noyes and E. K. Blair, followed by a general discussion led by Dr. Garrett Newkirk of Pasadena, California; who had come all the way to attend the meeting.

Wednesday afternoon was devoted to Clinics by Chicago practitioners in their offices, groups of visitors going from one office to another in regular order. Thus the men outside were able to see their Chicago friends at work under their native environment.

On Wednesday night a banquet was held, at which there were in attendance 1,121. The biggest banquet hall in the Hotel LaSalle was filled, the Red Room banquet hall was filled and an overflow was fed down stairs in other rooms. After the dinner was served—which, by the way, was a credit to the hotel management—the tables were cleared from the big banquet hall and chairs brought in to accommodate the audience for the speech-

making. And such speeches one is seldom privileged to listen to. They will all be published, so further comment at this time is unnecessary. Two events of the evening must be mentioned. A table was set apart next to the speaker's table for all the living ex-presidents—one of whom, was the first president of the Society, Dr. A. C. Van Sant, now of Omaha, Nebraska. The President, Dr. W. H. G. Logan, presented to each ex-president a beautiful bronze medallion, commemorative of the Golden Anniversary, with the recipient's name engraved on it and the year of his presidency.

The other event was the presentation by Dr. J. P. Buckley of a diamond ring to the President, Dr. Logan, on behalf of the Illinois clinicians who took part in the meeting. Both of these functions were very delightful and impressive.

On Thursday morning there was a general business session, with reports of committees and election of officers which brought the meeting to a close.

Thus has passed into history a gathering which was voted by every one present the greatest event of its kind ever held. It might not seem appropriate for an Illinois man to make such a statement as that, and it is done for only one purpose—to pay proper tribute to the man of all others who was chiefly responsible for the conception of the idea and for its successful consummation, the President of the Society, Dr. W. H. G. Logan. Other names might appropriately be mentioned as contributing loyally to the success of the event, but no one man carried the responsibility of every feature of the meeting as did he; and it was largely due to his directing genius that the whole affair was such a signal success.

CORRESPONDENCE.

Indianapolis, Ind., April 9th, 1914.

My Dear Dr. Johnson:

Your editorial, "The Fallibility of the X-Rays," creates in me a degree of cerebral unrest which, reduced to ink and paper, is as follows:

First, let me say I agree with practically everything you say,

and I am gratified to have you take such comprehensive editorial notice of the matter. I agree with practically everything you say, and yet, if I were writing on the subject, my title would be "The Infallibility of the X-Rays" instead of "The Fallibility of the X-Rays."

That the radiograph has its "limitations" and that it is sometimes "decidedly misleading" I grant you, but it is absolutely infallible; i. e., incapable of error. It is always the product of definite physical and chemical laws.

You say "it may be that we have not yet advanced sufficiently in its use to correctly interpret its findings." There you hit it. The apparent fallibility of the radiograph lies in our interpretation of it, in our lack of attainable knowledge which would explain "decidedly misleading" appearances; and, in our unwillingness to admit that it does have "limitations."

You cite an illustrative case. Allow me to cite one also. A patient suffering from neuralgia was sent to me for radiographic examination. I found a shadow in the region of the pulp chamber of a lower molar and made a diagnosis of pulp nodule. The next day the man who referred the case indignantly informed me by 'phone that, on the strength of my diagnosis, he had opened the molar tooth and there was no pulp nodule in it.

With no further explanation you would count this case as one demonstrating the fallibility of the radiograph. But then, as I have said, the radiograph is infallible; it is always the product of definite physical and chemical laws. Why, then, was there a shadow in the region of the pulp chamber of the lower molar? Something made that shadow. What was it? Perhaps an air bubble attached itself to the film at the time of its development. That would cause a spot. But the shadow I saw did not have the characteristic appearance of an air bubble spot, and, in further disproof of the air-bubble explanation, the spot occurred on two different negatives in exactly the same place. I asked to see the patient again and, upon examination, found an oxyphosphate of zinc filling on the buccal surface, at the gingival line. I had mistaken the shadow cast by the cement filling for a pulp nodule.

It was my mistake. The radiograph had done what it may be depended upon to do; it had unerringly recorded densities.

You may ask if a man is not always liable to make the same mistake I made. No. Once his attention is directed to the possibility of such an error he should never make it.

And so one may trace the mistakes in his radiographic diagnosis, from the radiograph, to the man who read the radiograph in all cases where mistakes have been made. You mention the most productive cause of mistakes when you close your editorial by saying, "This article is not intended as a reflection on the great utility of the X-Ray, which is cheerfully acknowledged, but merely to counsel caution on the part of those who *invariably** see things in *every** radiograph that is taken."

As a man who has worked to develop the field of dental radiography, I feel grateful to you for that remark, for the greatest menace to a more general use of the radiograph is the radiographer who never says, "this radiograph shows us nothing." The radiograph is the most efficient diagnostic aid at our command, but it does not always enable us to make a diagnosis. Radiographers must admit this and quit reading a definite diagnosis in every radiograph, whether it is there or not, else men like you, Dr. Johnson, will blame the radiograph for the fallibility of the radiographer. Fraternally yours,

HOWARD R. RAPER.

* The italics are mine.

PRACTICAL HINTS.

Edited by J. E. Schaefer, D. D. S.

(This department is for busy readers. We want short articles containing practical hints—the shorter the better. No article must exceed 200 words, unless of exceptional merit. Every dentist has some useful hint that has been of value to him, and if he will only put it in print it may be of equal value to others. That is what this department is for. Due credit will be given for every article sent. Address J. E. Schaefer, 1745 W. Harrison St., Chicago, Ill.)

To Remove Cemented Facings Without Fracturing:—Porcelain facings can easily be removed from detached crowns or bridgework by soaking for some hours in ordinary pickling solution of Hcl acid and then boiling in same.—*A. G. Salisbury, Takaka, New Zealand.*

A Device for Finishing Rubber Plates:—A large sized Felt Cone at least $\frac{3}{4}$ inch in diameter is suitable, saw a slit lengthwise to receive sand paper the same length as cone, place a wire ligature through and close slit at large end. Insert paper and wind around cone and fasten with a spring made from a spring used in Curtain Rods, which is superior to rubber bands.—*C. J. Palmer, D. D. S., Appleton, Wis.*

A Cusp Properly Reinforced:—After band for shell crown has been fitted, bite taken and mounted on articulator, carve typical cusp in plaster and leave top of band slightly exposed; take impression in dental lac, this will give you definite line for height of cusp. Now, trim dental lac down even with line and swedge cusp; trim off surplus, reinforce cusp full with 20k solder. Now, solder to band with 18k solder. By using this method one is sure that their cusps are reinforced the same thickness throughout.—*Merideth, D. D. S., Chicago, Ill.*

Use Eucalyptol:—The use of eucalyptol is indicated in root canal work for several reasons:

First—It will displace moisture, because eucalyptol has a greater affinity for dentin.

Second—It is a slight solvent for gutta percha and causes the gutta percha to adhere to the wall.

Third—It is a lubricant, making it easier to force the gutta percha into the small canals; and

Fourth—It is antiseptic.—*Fred Gethro, D. D. S., Chicago, Ill.*

Attachment for Gold Inlay:—A good attachment for a gold inlay where extra strength is required, say for instance, in a cavity involving the incisal edge of a central, or the occlusal surface of a bicuspid may be made after preparing cavity by drilling small pit at a suitable point, and then, after wax pattern is burnished into place, heating sprue wire and passing it through wax pattern into pit prepared for it. The projecting part of sprue is then reproduced in the gold casting, and forms a strong attachment when cemented into place. Care is necessary to prevent distortion of wax pattern when placing sprue in place.—*A. G. Salisbury, Takaka, New Zealand.*

The Importance of Healthy Epithelium:—The epithelium of the mouth is exposed to foodstuffs and drinks at temperatures which often destroy the life of the cell. Again, the mouth is exposed to the indiscriminate use of the toothbrush, tooth pick, etc. The accumulation of salivary calculus causes a marked irritation of the free margins of the gums. A healthy, intact epithelium is the best protection against pathogenic bacteria. The mouth at all times contains a great variety and number of pathogenic microorganisms, and, whenever the epithelial protection is broken by any of the above causes, the body is at once exposed to various acute infections. We do not know how often the various acute general infectious diseases are caused by this process.—*F. B. Moorehead, M. D. D. D. S.*

Failures of Partial Amputation:—I have had very little confidence in the partial amputation of roots because in the few cases I have had and those I have had the pleasure of observing have proved in such a short time to be failures. In the first place, it seems an unscientific and impractical method to partially amputate any root. In partial amputation you cut off the normal blood supply through the pericemental vessels and have no chance for repair to the remaining stump. If there has been congestion and disintegration of the tissue around that root, I believe radical measures are indicated. I am speaking now only of multiple roots. If that root is amputated well up into the crown and the surface polished, I think you have all had the experience of seeing the tooth stand for several years after amputation. I have several upper molars where I have amputated the lingual root and have crowned and put on inlays. I think there are as many as eight that have carried crowns and inlays and all doing service yet, but it was a complete amputation so that the surface could be kept clean.—*E. R. Carpenter, D. D. S., Chicago, Ill.*

Value of Buccal Flanges:—As an illustration of the value of the widening of the gum; alongside the posterior teeth in the multitude of cases of flat narrow jaws, is the following:

A patient who had worn a denture for a year was often calling for help, or relief from irritated gums, owing largely to the mova-

bility of the plate, disappeared for a year by absence from town. She put in an appearance saying, "If I had to endure this another year I would jump into the lake."

I took the plate and placed wax flanges on it and asked her to call the next day. She did so and said it was an improvement. I replaced the wax with rubber and she called a week later and smilingly said, "Well I am not going to jump into the lake."

In my own case, I have this experience, while one would suppose that berries and crust crumbs would be constantly getting under such movable plates, I rarely ever have any trouble. It is the cheeks that help hold the plate, as they lay on these flanges.—*Dr. L. P. Haskell, Chicago, Ill.*

Carving Occlusal Surfaces of Upper Molars:—To quickly determine the direction in which the transverse ridge of an upper molar should be carved, hold the case with the occlusal surface upwards and buccal surface nearest you.

If a right upper molar is to be carved, the transverse ridge should run, and should be bent in the same direction as the right index finger points when relaxed.

If a left upper molar is to be carved the transverse ridge should follow the direction of the *left* index finger.

With either the buccal or lingual (grooved) surfaces nearest you, the right or left index finger will point in the *general* direction of the transverse ridge, depending on whether the carving is of a right or left upper molar.—*Andrew J. Marcinkieuriz, Student Chicago College of Dental Surgery.*

How to Hold Cotton on a Smooth Broach:—There is one point in technique with reference to the treatment of pulp canals which I learned on a trip to New Orleans, a point I consider well worth the expense of the trip a great many times over. It had been my custom to dry pulp canals by twisting cotton fiber upon a spiral broach. Occasionally it was almost impossible to get the cotton off of the broach, consequently I lost much time. I tried many times to use a smooth broach as an applicator for medicaments, by twisting cotton upon the broach, but I could not get it to hold. For instance, when I wished to apply a drug in the canals

and pump it down towards the ends of the roots the cotton would become loosened. It is an easy matter to attach cotton to a smooth broach and all there is to it is to draw the smooth broach across a piece of sterile beeswax before twisting the fiber upon the broach. Any amount of cotton may be firmly attached to the broach and it will not become loosened in pumping the drug into the canals. That little point in technique has saved many hours of time for me. It has materially assisted me in drying canals because I am enabled to use a smooth broach of extremely small diameter and twist a few, or as many fibers as necessary, upon it, and come more nearly approaching the apex of the roots with the dry cotton fibers in drying the canals than by any other method.—*Carl D. Lucas, D. D. S., Indianapolis, Ind.*

MEMORANDA.

[Society notices will be given insertion in this department free of charge. Subsequent insertions will be charged for at the rate of \$2.00 an inch.]

SUSQUEHANNA DENTAL ASSOCIATION OF PENNSYLVANIA.

The annual meeting of the Susquehanna Dental Association will be held at the Water Gap House, Delaware Water Gap, Pa., May 26, 27 and 28. E. J. Donnegan, Sec'y.

AMERICAN SOCIETY OF ORTHODONTISTS.

The annual meeting of the American Society of Orthodontists will convene in Toronto, Canada, July 2d, 3rd, 4th, 1914. Wm. Ernest Walker, Secretary, 629-31 Maison Blanche, New Orleans.

NORTHERN OHIO DENTAL ASSOCIATION.

The fifty-seventh annual convention of the Northern Ohio Dental Association will take place at the Wigmore Coliseum, Cleveland, Ohio, Thursday, Friday and Saturday, June 4th, 5th and 6th, 1914. C. D. Peck, Sec'y.

IOWA STATE BOARD OF DENTAL EXAMINERS.

The next meeting of the Iowa State Board of Dental Examiners for the examination of candidates will be held at Iowa City commencing at 9:00 a. m. June 1, 1914. For application blanks and particulars write J. A. West, Sec'y, 417 Utica Bldg., Des Moines, Ia.

MICHIGAN STATE BOARD OF DENTAL EXAMINERS.

The next meeting of the Michigan State Board of Dental Examiners will be held at the Dental College, Ann Arbor, commencing Monday, June 15th, and continuing through the 20th. For application blank and full particulars address F. E. Sharp, Secretary, Port Huron, Mich.

INDIANA STATE BOARD OF DENTAL EXAMINERS.

The next regular meeting of the Indiana State Board of Dental Examiners will be held in the State House at Indianapolis, beginning June 15th, and continuing five days. For further information and blanks address the Secretary. F. R. Henshaw, 507 Pythian Building, Indianapolis, Ind.

ANNOUNCEMENT.

The County Civil Service Commission will hold an examination for Dentists on May 8th at 2 p. m. Two vacancies—one at Children's Home, paying \$100.00 per month, requiring one-half day visits on five days per week, and one at Old People's Home, paying \$10.00 per visit, requiring one visit per week.

For further information apply 547 County Bldg.

MISSOURI STATE BOARD OF DENTAL EXAMINERS.

The next meeting of the Missouri State Board of Dental Examiners, will be held in Jefferson City, June 8, 9, 10. All applications must be accompanied by a diploma from a reputable College, and a certificate of entrance to the Dental College. The certificate to show 15 units of credit. All applications must be filed with the Secretary five days previous to the examination. For further information address Dr. George E. Haigh, Secretary, Jefferson City, Mo.

GEORGIA STATE DENTAL SOCIETY.

The forty-seventh annual meeting of the Georgia State Dental Society will convene at the Ansley Hotel, Atlanta, Ga., June 4, 5 and 6, 1914, beginning Thursday, June 4, at 10:00 a. m. The Southern Branch of the National Dental Association will meet in connection with the Georgia State Society, and excellent papers will be ready and clinics given. All ethical practitioners are extended a cordial invitation. Any further information cheerfully furnished by the Secretary. Dr. M. M. Forbes, Sec'y, 803-4 Candler Bldg., Atlanta, Ga.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

The thirty-second annual session of the National Association of Dental Examiners will be held at the Rochester Hotel, Rochester, N. Y., beginning July 6th, at 10 a. m. and continuing until adjournment.

Every State Board holding membership in the Association is earnestly requested to have at least one representative present at this session. Members of all State Boards are invited.

Hotel reservations should be made immediately, as the National Dental Association meets in Rochester during the week beginning July 6th, and the attendance undoubtedly will be large.

T. A. BROADBENT, Secretary, 15 E. Washington Street, Chicago, Ill.

WISCONSIN STATE BOARD OF DENTAL EXAMINERS.

The Wisconsin State Board of Dental Examiners will convene in Milwaukee at Marquette University, on June 22, 1914, at 2:00 o'clock p. m. for examination of applicants to practice in Wisconsin. High School diploma, application and \$25.00 fee to be filed with the secretary fifteen days prior to above date. Dental diploma to be presented in advance of the examination. Junior dental students presenting a clear card for two years unconditioned work from a reputable dental college and filing a high school diploma, or its full equivalent, will be permitted to participate in the theory examination in

the following six major subjects: Anatomy, chemistry, physiology, bacteriology, histology, materia medica. The grades made in these subjects will be credited at subsequent examinations. Special application blanks for this examination and \$10.00 fee, together with high school credits to be filed fifteen days in advance. W. T. Hardy, Sec'y, 1404 Majestic Bldg., Milwaukee, Wis.

SIXTH INTERNATIONAL DENTAL CONGRESS. (LONDON.) SECTION X: DENTAL EDUCATION.

The subjects for report to be followed by discussion are: (1) the Teaching of Bacteriology for Dental Students: Methods of Teaching; Extent of Teaching. Reporters: Mr. J. Howard Mummery and ——— (2) A Practical Synopsis of Medical and Surgical Teaching for Dental Students. Reporter: Dr. Godon. (3) First Principles in Practical Teaching. Reporter: Dr. Gaddes. (4) Methods of Teaching Orthodontics to Dental Students. Reporters: Dr. Guilford and Dr. Martinier. The mornings of the 5th, 6th, and 7th of August to be devoted to Reports, and the afternoons to Independent Papers. The Committee of the Section is desirous of obtaining names of gentlemen willing either to discuss the above subjects, or to read papers on 'Dental Education.'

F. Bocquet Bull, Guy's Hospital, London, S. E., George Sheppard, 59 Merrion Square, Dublin, Hon. Secretaries.

RECENT PATENTS OF INTEREST TO DENTISTS.

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| 1,077,042. | Breath deflector or guard, J. E. Cooper, Chicago, Ill. |
| 1,076,957. | Die for forming tooth backings, H. L. Cruttenden, Northfield, Minn. |
| 1,078,829. | Die for forming dental backings, D. H. Carpenter, Minneapolis, Minn. |
| 1,078,844. | Artificial tooth, E. B. Fewell, Madison, Ind. |
| 1,076,197. | Substitute for gold leaf, F. Demel, London, England. |
| 1,076,534. | Dental instrument, F. T. Wallen, Bismarck, Mo. |
| 1,077,703. | Mold for making dental plates, J. W. Greene, Chillicothe, Mo. |
| 1,077,572. | Dental engine stone and mandrel, J. W. Welch, Chicago, Ill. |
| 1,079,540. | Device for use in connection with the articulation of artificial teeth, G. W. Clapp, New Rochelle, N. Y. |
| 1,079,414. | Clamp mouth mirror, I. G. Jirka, Chicago, Ill. |
| 1,078,412. | Blowpipe apparatus, W. C. Buckham, Jersey City, N. J. |
| 1,078,230. | Dental cottonholder, S. L. Whitright, Waterbury, Conn. |
| 1,075,818. | Blowpipe and using gases therein, M. K. Dunham, Boston, Mass. |
| 1,075,826. | Dental tool, A. K. Hoffman, Benton, Wis. |
| 1,075,978. | Dental water filter and heater, C. Joerin, Jr., Detroit, Mich. |
| 1,075,979. | Tooth, A. M. Kaehr, Dubuque, Iowa. |

Copies of the above patents may be obtained for fifteen cents each, by addressing John A. Saul, Solicitor of Patents, Fendall Building, Washington, D. C.

THE W. D. MILLER AMERICAN MEMORIAL.

The committee appointed by the Ohio State Dental Society at the 1909 meeting, for the purpose of raising funds for an American Memorial to the late Dr. W. D. Miller, desire to make the following report:

Funds have been received from the following states: Alabama, \$25.00; Arizona, \$25.00; Arkansas, \$50.00; California, \$60.00; Colorado, \$82.00; Connecticut, \$50.00; Georgia, \$60.00; Illinois, \$531.00; Iowa, \$200.00; In-

diana, \$75.00; Kansas, \$134.50; Kentucky, \$105.00; Maine, \$25.00; Massachusetts, \$100.00; Michigan, \$300.00; Minnesota, \$100.00; Missouri, \$100.00; Montana, \$15.00; Nebraska, \$100.00; New Hampshire, \$25.00; New Mexico, \$25.00; New York, \$125.00; Ohio, \$1,303.00; South Carolina, \$25.00; North Dakota, \$50.00; South Dakota, \$15.00; Oklahoma, \$31.00; Oregon, \$50.00; Pennsylvania, \$20.00; Tennessee, \$50.00; Texas, \$50.00; Utah, \$14.00; Vermont, \$20.00; Virginia, \$50.00; West Virginia, \$25.00; Washington, \$50.00; Wisconsin, \$25.00; Wyoming, \$10.00. Total, \$4,300.50. Interest on this fund to Dec. 1, 1913, amounts to \$382.94, making a total in the hands of the treasurer, Dr. Weston A. Price, \$4,683.44. Florida and Mississippi have each voted \$50.00 but the amounts are not in the treasurer's hands at this date.

The Memorial will consist of an 8 ft. bronze statue of Dr. Miller mounted on a 7 ft. granite pedestal and be placed in the lawn of the Public Library, the most appropriate site in the city of Columbus, the Capitol of Dr. Miller's native state. Suitable tablets will be prepared and it is the desire of the committee to state on one that the monument is erected by funds from every state in the Union. If your state is not represented in the above list, we want your co-operation in placing it there.

It is hoped that sufficient funds (\$5,500.00) will be in the treasury that steps can be taken at once towards the construction of this memorial, that it may be finished and ready for unveiling at the 1915 meeting which will be the 50th anniversary of the Ohio State Society. The valuable co-operation of the Honorary Committees in the several states is hereby acknowledged; they have made this memorial a reality.

Other professions have done honor to their distinguished dead, let us do the same for Dr. Miller, whose life was one of unselfish devotion to the scientific advancement of dentistry.

Edward C. Mills, Chairman; J. K. Callahan, S. D. Ruggles, Committee.

A BILL TO RENEW THE LOW BRIDGE PATENT.

In 1911 the late Senator Cullom introduced a bill in Congress to renew the Low Bridge Patent for another seventeen years. This bill met such determined opposition that it got no further than the committee on patents. Now a similar bill has been introduced by Congressman Fred A. Britten of Chicago as follows:

63d Congress, Sd Session. H. R. 15194.

IN THE HOUSE OF REPRESENTATIVES.

March 30, 1914.

Mr. BRITTEN introduced the following bill; which was referred to the Committee on Patents and ordered to be printed.

A BILL

To renew and extend certain letters patent.

1 *Be it enacted by the Senate and House of Representatives of the*
 2 *United States of America in Congress assembled,* That certain letters
 3 patent for an alleged new and useful improvement in dentistry, dated
 4 March fifteen, eighteen hundred and eighty-one, and numbered two
 5 hundred and thirty-eight thousand nine hundred and forty, granted to
 6 James E. Low, be, and the same is hereby, renewed and extended to
 7 James E. Low for the term of seventeen years from and after the
 8 passage of this Act.

Congressman Britten probably failed to realize the far reaching effects of this bill, but he will assuredly be informed by the dental profession. Meanwhile it may be interesting to reproduce a letter written by Congressman James R. Mann to Dr. J. W. Shedd of Chicago on the occasion of the

introduction of Senator Cullom's bill, and published in *THE DENTAL REVIEW* of October, 1911. It reads as follows:

"Chicago, September 11, 1911.

Dr. J. W. Shedd,
132 North Wabash Ave., Chicago,

My Dear Dr. Shedd:

"I have your kind favor in reference to the Cullom Bill, Senate Bill No. 1342, introduced by Senator Cullom at the recent Session of Congress, to extend the James E. Low patent.

"I am very much surprised that Senator Cullom should introduce this bill. I do not believe it has any merit. I looked into the matter once and concluded that it would be a gross abuse of power for Congress to pass the bill. A similar bill has been urged for several years. I shall certainly fight the bill and I feel sure it will not be passed by Congress. While ordinarily I do not like to express opinions in advance, yet this bill is so flagrantly bad that I promise you it will meet with determined opposition if it comes up in the House of Representatives while I am a member. I again express surprise that Senator Cullom should have introduced it.

"Yours very sincerely,

"JAMES R. MANN."

1350 First National Bank Building.

OBITUARY.

DR. JOHN W. MOFFITT.

Died February 27, 1914, in Harrisburg, Pa., of old age, in his seventy-ninth year, John W. Moffitt, D. D. S.

Dr. John W. Moffitt, a well known pioneer of modern dentistry, and one of Nature's guileless gentlemen, has crossed to the Great Beyond.

He was the son of the Rev. John J. Moffitt, D. D., and Charlotte Eppley Moffitt, and was born at Orwigsbury, Pa., on June 5, 1835. Before he had attained his second year his father removed to the (then considered) far West, and settled in Ohio. Early dentists often combined two callings, and his father practiced dentistry in addition to attending to his ministerial duties.

Dr. John W. Moffitt received the usual school education of the period; and afterwards attended Bethany College, Va.

He early evinced an aptitude and enthusiasm for dental art. After a period of pupillage with his father, and also with Dr. Samuel Hullein, of Wheeling, Va., (now W. Va.), and thus being instructed in the then highly guarded mysteries of dental art and practice, he opened an office at Cadiz, Ohio, in 1853.

In 1855 Dr. Moffitt went on a trip through part of South America and the western part of the United States, and remained quite some time in California. Returning home late in 1857, he married, and settled down to practice in Harrisburg, Pa. Since then, until prevented by the state of his health a few years ago, he continued in active practice, except during his service as a Union soldier in the Civil War. When under fire at the battle of Antietam he received orders to report at Hagerstown, Md., as an Assistant Hospital Surgeon, and served in that capacity until honorably discharged in 1864.

Dr. Moffitt was one of our earliest porcelain specialists. Over sixty years ago he carved and baked porcelain blocks and teeth for his own use



John W. Moffitt, D. D. S.

and that of the profession out of materials dug up and compounded by himself. Afterwards he supervised the manufacture of teeth on a large scale for some of the early manufacturers, personally carving the models, and molding, casting and finishing the bronze molds, baking the teeth, and in fact doing everything necessary in tooth manufacture. He always was a strong advocate of high fusing porcelain.

Despite his love for the ceramic art, being an ardent disciple of Izaak Walton, he would leave a continuous gum case to catch a trout.

Ceramics was one of his hobbies. In 1860 he was awarded a patent for non-sectional block work baked on platinum. This he later abandoned to the profession through the Odontographic Society of Philadelphia. Another patent covered a tooth for continuous gum work, as now practiced. He also obtained a patent for a tooth for rubber and plastic plates. Quite recently he introduced a method of attaching teeth to the platinum plate without soldering in continuous gum work.

The first bayonet shaped forceps were made by a Philadelphia firm from a pattern cut out in wood and submitted by him; and many old forceps show his name imprinted thereon.

Dental flasks, adjustable articulators, separators, amalgam alloys, cements, and many other products of his genius have been manufactured; but his modesty and retiring disposition kept him from claiming the honors, and sometimes emoluments, received by others therefrom. He was a

veritable encyclopedia of means and methods in the preparation of dental necessities; and his fund of information was willingly shared with all.

Obturator and artificial velums were a most successful branch of his practice; and quite recently he made an ingenious and important improvement in the construction of the latter.

He did not often place his ideas in print, although a few articles, chiefly on porcelain subjects, appeared over his signature in dental journals.

He was one of the first delegates to the American Dental Association; and at its meeting at Nashville, Tenn., in 1870, represented the Pennsylvania Dental Society. He was an officer and charter member of the Pennsylvania Dental Society, the Lebanon Valley Dental Society, etc., and in fact outlived a number of societies in which he was once prominent. He was also a member of the masonic fraternity.

Dr. Moffitt had a leading part in obtaining from the Pennsylvania Legislature the charter for the Philadelphia Dental College, in which he matriculated in 1864. He, however, did not present himself for examination for his degree until 1888, when he graduated. From the institution of this college he acted as demonstrator in prosthetics and porcelain, with some short intermissions, for over forty years; and hundreds of successful practitioners can look back gratefully to his instruction.

As stated, he was married in Harrisburg, Pa., on Dec. 20, 1857, to Harriet R. Wenrick; but his entire family predeceased him. He is survived by a brother, also a dentist, now retired, and a nephew, Dr. J. J. Moffitt, who is a member of the Pennsylvania State Dental Examining Board.

Interment was in Harrisburg Cemetery on March 2, 1914.

T. J. McL.



THE DENTAL REVIEW.

Vol. XXVIII.

CHICAGO, JUNE, 1914.

No. 6

WHAT WE KNOW AND WHAT WE SHOULD DO IN CROWN AND BRIDGE WORK.*

BY A. W. THORNTON, L. D. S., MONTREAL, CANADA.

Does the title of this paper imply that the dentists of North America are ready and willing to make their operations in crown and bridge work measure up to, and harmonize with their knowledge of this all important subject? Or does the title rather imply that there is a great discrepancy between our knowledge of the subject, and the expression of that knowledge as manifested in our operations? Or does it mean perhaps, that in the minds of those responsible for the program, there was a desire to present in concrete form the known facts, the bedrock principles, the evolution, and the things evolved in that phase of our daily avocation which we are pleased to term crown and bridge work?

To some it means that established principles should be wedded to efficient service, and that what honest seekers after truth have joined together should not be put asunder by dishonest traffickers in human suffering.

But whatever the words of the title may suggest, let us hope, that as a result of this meeting, and from the discussions that may arise in connection with it, there may follow a wider knowledge of the fundamental principles of the subject, a nearer approach to uniformity and standardization of methods of practice, and an absolute cessation, of the glaring dishonesties which disfigure human countenances, make veritable cesspools of the people's mouths, and bring upon the dental profession the justly merited and caus-

*Read before the Fiftieth Anniversary of the Illinois State Dental Society, March, 1914.

tic criticism of all men, with any sense of estheticism or appreciation of the value of oral hygiene.

We dream of the good time coming when preventive medicine and preventive dentistry will rob the human family of many of the ills from which it now suffers. But that time is still a long way in the future, and the present generation of dentists must continue to fill teeth, make crowns and bridges and artificial dentures, and treat, as best they know how, pyorrheal conditions. In other words so long as the people of every civilized country in the world, suffer almost universally from dental caries, so long must the work of the average dentist be reparative, rather than preventive, and crowns and bridges must continue to be made and inserted. In view of this universal suffering to which I have just referred, let us view the subject very briefly from the standpoint of the patient.

In one of the text books on crown and bridge work this sentence occurs, "In all our operations, the patient's welfare should always be our first consideration." No man, making any claim to decency, would dare to deny that statement, or attempt to establish any lower standard. From this standpoint then, what should we do in crown and bridge work?

Let me quote from a former paper, bearing on this subject,

"1. Where a tooth has been lost, or a number of teeth have been lost from the dental arch, it is the aim of the operator to preserve or restore the integrity of that arch.

"2. This preservation, or restoration, should be brought about with the least possible sacrifice of serviceable natural tissue, and by the introduction of the least possible amount of foreign matter, commensurate with the service which the crown or bridge is to render.

"3. To make such restorations natural in appearance, and to harmonize with the other features of the face.

"4. To give to the patient a condition or feeling as nearly normal as possible so that there will be the least possible consciousness of the restoration which has been made."

I believe if these four fundamental principles could be kept constantly in mind, many of our operations would be very ma-

terially modified, or very radically changed. We know, better than we do.

It will not be necessary to go back to the catacombs, or the Egyptian mummies, to prove that crown and bridge work was attempted while civilization was in swaddling clothes. But let us discuss some of the early practices of what is termed modern crown and bridge work, practices which still persist and are in daily use.

Take the Richmond Crown, as that particular form of crown was made thirty years ago, and as in many places it is still made and adjusted today. It was made with a full band, encircling the incisal end of the root, a porcelain facing, with a metallic backing, and the facing ground incisally to receive a metallic protecting tip. Many such crowns are still being used. Should they be continued?

The three essential features of the crown were, the full band, the metallic backing, and the gold tip. I know that in discussing the full band principle I am on controversial ground, and much may be said on both sides of the question.

Those who still use the full band claim as its advantages,

1. That it prevents labial displacement of the crown.
2. That it prevents the splitting of the root.
3. That it more effectually protects the end of the root, by preventing disintegration of the cement.
4. That it affords a stronger, more stable attachment of the crown to the root.

Dealing with these advantages, we may concede without discussion, that a full band encircling the end of a root is the best known way of preventing splitting.

We may concede also the fact that the effect of the full band will have a tendency to prevent labial displacement.

And without hesitation, I believe that all will concede the fact that the full band affords a more stable attachment of the crown to the root.

But to say that it more effectually protects the end of the root, by preventing the disintegration of the cement, is a statement of fact, contingent on so many other conditions, that this claim can not be looked upon as an established principle. The good or evil

effect of a full band depends entirely on the fit of the band. If a band of proper width, be made to accurately fit the end of a root, then all the advantages already enumerated may be and are conceded.

But an ill-fitting band, not only does not afford better protection to the end of the root, by preventing disintegration of the cement, it actually hastens disintegration and becomes an absolute menace to the integrity of the root.

This is so obvious that the mere statement should suffice. An ill-fitting band, standing out from the periphery of a root, forms a projection, or shelf, or shoulder, for the lodgment of debris, and the retention of fluids of the mouth, which must in the very nature of things defeat the object we have in view, and hasten the process which we are trying to prevent.

If it be conceded that a full band of proper width, accurately fitting the end of a root, possesses the advantages which we have just enumerated, the question arises why not adopt it as a fixed principle, and make its universal use the law of practice. Because of the difficulties that stand in the way. To remove the enamel from the periphery of a root, to adapt a band and coping (a cap) to this, to fit a band of not more than a millimeter or a millimeter and a half in width, beneath the free margin of the gum, and to this cap, solder a dowel and attach the crown proper requires a nicety of manipulation that few men possess.

In addition to the difficulty which we know exists in connection with the accurate adaption of a full band, let us examine still further the objections to its use, as a principle, or method of practice. Ask any man, who has been at all observant, his opinion of the full band, as a cause of gingivitis. I think that without exception, men who have given any intelligent thought to the subject, will say that the full band principle has been the fruitful cause of much of the gingivitis with which we come in contact in daily practice.

Ask the specialist in pyorrhoea his opinion of the full band, as adapted by the ordinary man, in every day practice. Will he not tell you that thousands of teeth have been lost through so-called pyorrhoea, in which the initial inflammation was produced by an ill-fitting band. Is it not a remarkable fact, that while volumes

(and large volumes) have been written on crown and bridge work, so very little of a definite nature has been written regarding the technic of preparing a root to receive a band? All writers are agreed that reduction and preparation are essential, but few of them have written much of a definite or helpful nature, regarding the mode of reduction or the means to be employed. In Goslee's *Principles and Practice of Crown and Bridge Work*, this paragraph occurs,

"The importance of properly trimming the end of the root to begin with has already been sufficiently emphasized, and is particularly apparent in the shaping of anterior roots, because of their even more conical shape. If this is neglected, in the slightest degree, the cervical edge of the band must form a shoulder, between it and the surface of the root, which though hidden by the gum, affords opportunity for the lodgment and accumulation of food deposits, the subsequent decomposition of which is productive of a decidedly unhygienic condition, and much consequent discomfort. While nature may aid the indifferent, careless or negligent operator for a time, by covering over the evidences of such efforts, and in this connection the tissues surrounding roots, supporting artificial crowns covers a multitude of sins, the result is inevitable, hence no band at all were better than one which does not fit."

Will you permit me to quote the succeeding paragraph to the one I have just read, "In the esthetic restoration of the crowns of anterior teeth, success with all it implies, is codependent upon the ability to observe the minutest details in an endeavor to simulate nature, and that degree of enthusiasm and ambition which prompts a thorough and efficient execution of the artistic requirements involved."

One further quotation from the same author will put this important and much discussed question intelligently before you. "It is also readily acknowledged that the mechanical adaptation or relation of the band to the end of the root must be uniformly deep, and close enough to the periphery to preserve the continuity of the surface between root and crown at the line of junction beneath and within the free margin of the gum, so that no irritating influence may result. At the same time it is almost equally essential that the band should be invisible, and thus admit of bringing the

porcelain into close proximity with the gingival margin, and yet strong enough to retain its given shape and form during the process of fitting and adapting, and when subsequently subjected to the stress of mastication." With these three paragraphs I am in pretty close accord. Let us briefly consider them in the inverse order, to that in which they have been read.

A band must be narrow enough to be entirely invisible, it must be broad enough to have strength to retain its shape during the process of fitting and adapting, it must have bulk enough to resist the stress of mastication, but not sufficient bulk to produce mechanical irritation. Truly it seems to be expecting a good deal of one small piece of gold or platinum plate.

In another paragraph just quoted, bearing on this subject of full bands we are told that, "success depends on the ability to observe the minutest details in an endeavor to simulate nature, and that degree of enthusiasm and ambition which prompts a thorough and efficient execution of the artistic requirements involved."

I believe that most of you will agree with me that the adjectives employed in the paragraph are fairly strong.

But how many of you possess the ability to observe the minutest detail to closely simulate nature." How many of you are always fired with that degree of enthusiasm and ambition, which the author says are necessary to properly adapt a full band? How many of you would plead guilty to "thorough and efficient execution of the artistic requirements involved?"

No, dentists are just ordinary men who have had some special training in technics, but that by no means makes of them all "careful observers of minutest details," "enthusiasts with an enthusiasm which prompts to efficient execution" to say nothing of "artistic reproduction of nature's efforts." Artists we are told are "born" not "made" and those of us who have given much time to college work are thoroughly convinced that most of the dentists of this age are "made," and that very few indeed are "to the manor born." And now permit me to quote again the concluding words of the first paragraph I have quoted "no band at all were better than one which does not fit."

With every word which I have quoted from Dr. Goslee's book I am in perfect accord, but when we think of the many difficult

conditions which are continually present, and the many mechanical accuracies which must be observed, and when we add to that the testimony of the most observant men of the profession, that full bands are a fruitful source of gingivitis of most serious nature, and when in addition to these, we know that continuity of outline and accuracy of adaptation may be more easily obtained, and that provision may be made against labial displacement and root fracture, then I believe that we are justified in saying that the full band principle should be discarded except under the most exceptional circumstances.

The second feature of the Richmond Crown, which many still adhere to, is the metallic backing—I am safe however in saying that this feature of modern crown work has few advocates. Its defects are so apparent that a very short time will be necessary to discuss it. Whether the backing be of pure gold or platinum, one thing is certain, it destroys the translucency of the tooth, and materially modifies the shade of the porcelain. But in addition to these drawbacks, all will admit that no matter what method may be employed to adapt the backing to the porcelain facing, the adaptation can never be sufficiently perfect to exclude the fluids of the mouth, and a condition must of necessity exist which is far from hygienic. The removable or replaceable facings have some advantages, in that a layer of cement forms a bond of union between the backing and porcelain facing, and for a time hermetically seals the space that exists between the two, but even for this form of facing the metallic backing is a decided objection to their use in the anterior part of the mouth.

The metallic "tip" must have many friends among the practising dentists at the present time, for at least one firm has put on the market a removable facing with this feature (it may be tipped) as one of its chief characteristics. And yet the fact remains that a gold tipped tooth (that is, an anterior tooth with a visible gold incisal edge) always was, is now, and always will be a very faulty substitute for a natural organ.

And certainly for a single crown there is absolutely no excuse for using any form of crown that renders necessary even the smallest amount of visible gold.

Knowing these things, what should we do? This—Where a

single crown is to be adapted in the interior of the mouth, some form of full porcelain crown should always be used, and to this rule I can think of no possible exception.

You will understand of course that when I speak of a full porcelain crown, I mean, any form of porcelain crown that may be used as a ready to wear crown, or in conjunction with a cast metallic, or other base. Another feature that should be finally adjudicated upon, is the question of devitalizing molars and bicuspid before adapting shell crowns.

I am fully aware that there is considerable diversity of opinion concerning this matter, and yet I believe that careful thought will enable us to establish a rule, or method of procedure, from which there will be few exceptions. Let me quote from one of the text books on the subject. "It is now a more or less generally acknowledged belief, of the most eminent authorities that the pulp is purely a formative organ, and that its physiological function terminates with complete development of the tooth, that it is not necessary to its vitality, stability and longevity after maturity, providing that the pulp cavity is perfectly filled; thus there seems to be no good reason for its preservation, taking into account the modern aseptic means of removing it, and treating and filling the canal." Especially is this true where a crown is indicated, because the abnormal encasing of the tooth, so as to practically isolate it, must at least diminish the external influences of secretions and temperature upon the nerve and blood supply of the pulp; and because usually such teeth have already been subjected to the irritating and devastating influences of caries, each of which seems but to invite, and pave the way for ultimate destructive processes. Clearly the teaching here is that all molars and bicuspid should be devitalized before adapting to them shell crowns.

On the other hand, many take the ground that devitalization is not only not necessary, but that the destruction of the pulp actually produces conditions exceedingly difficult to deal with, and invariably leaves a lame or crippled tooth, predisposed to pericemental inflammation, and other physical and pathological conditions which make the tooth less stable, and hasten the time of its final loss.

What are the facts of the case? I believe that every man who

has given careful thought to the subject will agree that in ordinary vital teeth, it is impossible to prepare a molar or bicuspid so that a band may be properly fitted, without causing unbearable pain to the patient. As a result, where this is attempted, preparation stops far short of perfection, and ill fitting bands with all their attendant evils are the result.

Now what are the objections that may be urged against devitalization?

First there is the destruction of tooth tissue that must occur, in order to properly fill the root canals, and pulp chamber.

Second there is the increased friability or brittleness always present to a more marked degree in a non-vital than in a vital tooth.

And third, there is the difficulty of properly filling the root canals of any tooth.

What are the objections that may be urged against trying to fit a band to a vital tooth. I have mentioned but one, the unbearable pain. But there are others. The necessary grinding, the cementing medium, the unnatural environment due to the presence of the metallic crown, all tend to produce an irritation which causes the pulp to recede, after a period of activity, during which the canals become more constricted owing to the deposition of secondary dentine, and if death of the pulp do occur, its treatment and removal are made increasingly difficult. The great drawback however as has already been stated, is the unbearable pain, which renders perfect preparation impossible, and makes an illfitting band with its attendant evils, the sequel to all such efforts.

So in regard to devitalization this is the position: If we do not devitalize we must content ourselves with very imperfect reduction and preparation. This means illfitting bands, and inflamed and suppurating gingival areas.

If we do devitalize, we must sacrifice tooth tissue, face the difficulty of filling root canals, and the friability of non-vital teeth.

I believe the lesser evils will result from devitalization, for while difficulties present, no matter which method we adopt, it cannot be too frequently nor too strongly urged, that most of the ills that have followed in the wake of crown and bridge work, have come from a single source, ill fitting bands. Therefore, if you are

going to adapt a crown embodying the full band principle, to a molar or bicuspid, devitalize.

Early in the paper I spoke of what should be attempted, looking at the question from the standpoint of the patient. To bring about these conditions what should be the picture or aim, ever present in the mind of the dentist.

1. Continuity of outline between the root and the crown.
2. Accuracy of adaptation of the crown to the root.
3. Harmony with the remaining teeth, and with surrounding tissue.

At Buffalo recently, Dr. Leon Williams used this illustration. He said, "The painter Millet was once asked which was the most beautiful tree in a certain district in which the artist was then living. His reply was, the one which harmonizes most perfectly with its environment." The same is true of crown and bridge work, that is most beautiful, and most to be desired which "harmonizes most perfectly with its environment." Environment, however, should in this latter case be made to include utilitarian as well as esthetic considerations.

A new factor entered into crown and bridge work with the advent of the casting process. For a time it seemed that all the old processes were to be abandoned, and that a new technic would have to be mastered. Cast base crowns were made without any attempt to adapt a coping either to the root end or to the porcelain. Extensive bridges were made, the entire metallic parts of which were cast directly to the porcelain facings. But the shortcomings of such procedures soon became apparent, and now while casting has lost none of its usefulness, the fact is recognized that it has certain limitations.

Better results are always obtained when a coping of pure gold or platinum is first adapted to the root end. The same is true regarding replaceable molars or bicuspids, such as the Goslee or other similar crowns. If a box of pure gold be first swaged to the porcelain, a more accurate adaptation will be obtained than where the wax is adapted directly to the porcelain, and this wax then reproduced in gold.

Thus far I have dealt simply with the question of single crowns. I do not feel that it will be necessary to deal exhaustively with the many forms of bridges now in use, for I realize that the forms and devices used in the construction and adaptation of bridges will continue as varied as the different standards of inventive genius of the progressive men of the profession.

But some words of warning should be uttered against the practice, all too common, of inserting large pieces of fixed bridge work, especially if it be necessary to devitalize a number of good natural teeth to obtain abutments.

Perhaps you will grasp my meaning more quickly if I suggest a hypothetical case. If a case presents where the bicuspid is missing on one side of the maxilla, and the bicuspid and first molar on the other, is fixed bridge work indicated? I do not now believe that it is, although I have put in just such pieces. But properly to prepare abutments for these two bridges it would be necessary to devitalize two molars and two cuspids.

The difficulty of making such pieces so that they would be easily kept clean is a pretty formidable task. If the difficulty of maintaining cleanliness were the only objection to be urged, it might not perhaps be considered too serious. But when we undertake to add to this the serious matter of devitalizing four sound teeth, and then in their crippled condition expect them to assume the burden of five additional teeth, we are creating a condition which is likely to cause very considerable discomfort, which I believe may be entirely avoided without increased inconvenience to the patient, and with enhanced cosmetic effect.

Two small gold saddles united with one or possibly two pieces of wire, passing from side to side of the palatal arch, carrying the missing teeth and made stable by some form of clasp adapted to the teeth most convenient for the purpose will, I believe, in the vast majority of cases, be a much more satisfactory arrangement than the forms of fixed bridges so commonly used.

The practice of making a small saddle, to act as the support of a bridge extending over the bicuspid and molar region, is surely such as to invite disaster.

With the many fanciful devices which have been exploited from time to time, such as bridges supported on abutments of porcelain or metal, introduced into the bony substance of the jaw, or large pieces of bridge work fixed with screw nails, or other devices which require the aid of a mechanical engineer to insert and to remove, the essayist has not much sympathy. Lest I be misunderstood, permit me to add that I admire the genius of the men who can devise and produce such intricate and accurately adapted mechanical appliances, but unless a large bridge be so made that it may be easily removed, by the patient for the purpose of cleansing, then experience has taught me that they become so filthy that no patient should be forced to maintain so great a nuisance, and so constant an offense.

Since the advent of the various attachments, now in general use, such as the Roach, Gilmore, and other similar attachments, or modifications of these, the excuse for large pieces of fixed bridge work has entirely disappeared, for stability may be obtained without sacrificing the ability to preserve mouth cleanliness with all its concomitant comforts.

Knowing this, what should we do? Refuse to insert or refrain from inserting large pieces of bridge work that can not be kept clean by the expenditure of ordinary time and attention.

Need I say a word concerning the use of open face crowns as abutments or occlusal surfaces of gold that lack all pretensions to anatomical reproduction of the occlusal surfaces of the missing teeth; of inlays as abutments so small as to be practically useless, and so mechanically imperfect that they are not mechanically retained in any direction? The evils of such practice are so well known that I will not insult your intelligence by taking time to enumerate them.

Permit me in conclusion to throw upon the screen a few pictures, the first few simply to show some ordinary methods of producing that continuity of outline and accuracy of adaptation to which reference has already been made, and the others to show some places where the fixed bridge work has been advocated, and where, in my estimation, removable appliances would better have served the patient.

SOME CONSIDERATIONS REGARDING THE SILICATE CEMENTS.*

BY ROBERT J. CRUISE, D. D. S., CHICAGO, ILL.

In this era of our profession's progression, when we are being accosted every year by efforts towards a higher estheticism, and the exactness of scientific knowledge is opening up the path to marvelous artistic accomplishment, is it any wonder that more than passing interest is aroused amongst us by whatsoever seems to offer a hope of our reaching the desired goal?

It is with some reluctance in these desperately practical and busy days that we spend even a moment in a review of the apparently impractical considerations that may surround a practical subject, but to be perfectly candid, I must say that I have not felt quite equal to a cold-blooded discussion of this subject without some introduction by way of the higher and artistic inspirations which might lead us to interest ourselves in the possibilities of the silicate cements.

Science glories in the exactness of its knowledge, and leads to the accomplishment of art. Art is the noblest mission of man, for it is the exercise of thought and action which seeks to understand the world and make it understood, reaching out by strange irregularity for its highest accomplishment in its concealment. The artistic world is full of illustrations that the highest art is the concealment of art. It is only of recent history that the world was shocked when it learned that Leonarda da Vinci's masterpiece, Mona Lisa, had been stolen from the Louvre in Paris; today it has been restored to its honored place in that gallery of art, and some estimate of its priceless value and artistic worth may be gleaned from the fact that the increased guards placed upon it have asked for shorter watches to be relieved from the bewitching smile of a woman speaking to them from a cold and passive canvas.

Dr. N. S. Jenkins, the noted American dentist of Dresden, in a paper read before the American Dental Society of Europe, not very long ago, deploras the shocking dental disfiguration which still

*Read before the North Shore Branch of the Chicago Dental Society, April 13, 1914.

prevails in America through the use of the "Barbaric Gold and Pearl."

He says, "Proud as we are of the great intellectual, political and material achievements of American civilization, we must yet admit that in such particulars as matters of good taste, and in the general influence of the fine arts and graces of society, we still defer to Europe. Among the accepted principles of European society is the rule that good taste must not be strikingly violated, but a conspicuous departure from this rule is found in the shocking dental disfiguration of great numbers of American patients."

These compliments to Europe by an American sound good to one who happens to be an imported article, like myself, but I really feel with Dr. Jenkins that many American practitioners have too easily excused themselves from learning the possibilities and principles of artistic tooth restoration, because their patients have not demanded it.

The duty of every educated man is to lead and not to follow, and he who deliberately disfigures the poorest of his fellows, rather than give himself the trouble of learning how to conceal his art, dishonors himself as much as his profession.

The porcelain inlay, that erstwhile object of hero-worship, has been more or less outlawed in practice for good practical business and commercial reasons, it being not only embarrassment which overcomes us when patients return with inlays in their pocket-books or their stomachs, but the silicate cements, begotten of this tidal wave which tried to spell a higher artistic accomplishment, seem to have opened up a new and practical field.

It is with the necessarily limited experience of an individual practitioner, and a somewhat careful study of the silicate cements that I will endeavor to entertain you this evening.

My experience extends over a period of about seven or eight years, during which time I have put in many fillings with these materials, and I must confess that I have lived to see return to my office from amongst them, some of what I conscientiously believe to be the worst efforts at tooth restoration ever made by anybody with anything.

But, gentlemen, it takes rain to make the flowers grow, there is a silver lining to every cloud, and sometimes the land that is

devastated by storm and cyclone and lightning is benefited by the disaster, so I have worried on letting failure make place for renewed effort and experience, and while I believe that the silicates are still in the experimental stage, they begin to appeal to me as a more interesting proposition, full of possibilities. Their use calls for a special study, for they demand a special technic in mixing and manipulation, without attention to every detail of which they will be invariably failures, barring the exceptional and Providential accidents of success which occasionally delight us in our dental practice after we have neglected all the accepted rules of practice.

Let us then briefly study them as at present on the market, viewing the composition of the powder, the liquid, their sources, the reaction whereby they are formed into a filling material, the influence, the all-important influence of temperature, the proper mixing slab, and how to keep it at the proper temperature, the technic of mixing and insertion, the best kind of instruments to use, the cavity preparation, and the cavities for which they are most indicated, and most likely to be successful, their possibilities in combination with the gold inlay.

The silicate cements at present on the market are composed principally of the natural silicates, aluminates, rare earths, feldspar and calcium, which latter element goes largely to determine and make the setting process. The rare earths are used largely to influence the formation of different colors.

One manufacturer of silicate cements has seen fit to christen his product Synthetic, but as a matter of fact all the silicate cements are synthetic, and the meaning of this word should be understood.

A synthetic preparation is one made by the union of, or, if you like, the combination of different elements.

What is the liquid? This may be answered by saying modified phosphoric acid. If you put it to the test of taste as compared with the liquid used with oxid of zinc cement you will find it decidedly less acid. What the other liquids are is a trade secret, which might be found out by analysis. The manufacturers are probably more concerned in concealing their proportion than their actual nature. One manufacturer claims a minimum of acid and a reaction by simple hydration, by this means eliminating possible

trouble and irritation to the pulp due to the excess of free acid left in a mixture of silicate cement, and liberated during crystallization, for the mineral components of these cements are much less soluble than is either oxid of zinc or copper.

While on this point, and lest I should forget it, let me warn against the insertion of a large mass of silicate cement into deep cavities in vital teeth approximating the pulp. Silicate cement is a good conductor of heat and cold, therefore deep cavities in vital teeth should be lined with a filling of oxyphosphate of zinc. Silicate cement has absolutely no therapeutic value. Add to this its conductivity of heat and cold, and the liberation of free acid in a mix of it, and it is not hard to account for the trouble from death of pulps underneath it which has at times dismayed operators.

The source of the various components of the silicate cements is endless; suffice it to say that they are found in nature almost everywhere, but undergo a very elaborate process of reduction and refining to fit them for our purposes.

Now we come to the question of temperature, and here, with your permission, I would like to make a little digression from the direct consideration of the subject before us, for the sake of general and interesting information, before bringing out the important relations between temperature and the mixing of silicate cements.

Humidity, temperature and rainfall have a great effect on the well-being of man, phenomena which deserve more of our attention and knowledge than they have received, and in these days of quest for aids to health and hygiene some definite information seems imperative.

Watery vapor is being constantly distilled into the atmosphere from the great water surfaces, the various rivers, lakes and even from the moist soil. These tiny molecules are mostly invisible as they rise into the atmosphere from the great water surfaces, but if the strata be much colder than the water surface, the evaporating water instantly appears as vapor or fog. Aqueous vapor while constantly in our atmosphere is passing into it by evaporation and out of it by condensation, they really work into one another's hands.

The percentage of water or moisture in the air is measured by an instrument called the Hygrometer, by means of it we arrive

at what is known as the Dew Point, that critical temperature at which moisture begins to be deposited in drops.

We know from our own sensations of the changes in the amount of vapor in the air; sometimes it feels damp, sometimes it feels dry, the housewife has the good and bad days for drying clothes.

Now the air receives vapor not in a definite quantity, but in proportion to the prevailing temperature, warm air holds more moisture than cold air therefore while a porous body, for instance a lump of sugar allowed to draw water into it, takes up a definite proportion of moisture, the air holds its proportion of water, according to whether it is warm or cold, but in our artificially heated houses and offices, the air is so deprived of its moisture that we have that uncomfortable condition which we all experience in steam heated buildings.

In the summer time we have the air in our offices more or less as it is outside, and we experience often in these climates that unpleasant condition of a temperature at about 80° Fahrenheit, great humidity, and the consequent sticky unpleasant feeling which it produces.

A room with a high temperature, and a low amount of moisture feels colder than a room with a lower temperature and a greater amount of moisture, therefore you will save money and increase your resistance to disease, if you put on less coal, and increase your humidity.

Lack of moisture in the air causes not only discomfort, but accounts for a large percentage of catarrh, colds, and other diseases of the mucous membranes. Proper humidity will not only prevent this, but save from 12½ to 25 per cent of the total cost of heating houses and offices in winter, and we will be far more comfortable and healthy.

Therefore with my advice to all to study these interesting phenomena in their relation to health and hygiene, I will pass on to the direct relation between temperature and the mixing of cements.

We all know that the mixing of cements calls for a chemical reaction, and that chemical reactions are influenced by temperature, therefore if we want to get a proper reaction, not too fast not

too slow, we must mix our cement on a slab of the proper temperature. This refers particularly to the silicate cements.

The setting of cements can be influenced by the properties of both liquid and powder, but apart from that temperature plays an important part, and it has been satisfactorily demonstrated that a slab at a temperature of 60° Fahrenheit gives us the proper reaction.

The reasons for this are twofold, a slab at a temperature much above 60° gives us too rapid a reaction and setting, a slab at a temperature much below 60° gives us too slow a reaction, and a filling material which when vital teeth are to be considered is too cold to be inserted without endangering irritation to the pulp. Another very important point in this connection is that with a slab at 60° we are able to incorporate more powder into the liquid thereby obtaining a more dense and perfect mass, and this can be done before the mixing process must cease and the insertion begin.

For about nine months in the year, in this climate, with a temperature at about 68° or 70° and a low or correct humidity, there is no difficulty to be encountered in using a slab at 60°, but when in the summer months the temperature ranges in the high seventies or eighties, and the humidity is great, if you use a slab at 60°, as the dew point is above that figure, you will have a precipitation of moisture on it, a serious impediment to the mixing of cement of any kind, and an absolute barrier to the mixing of the silicate cements. The latter demand the exclusion of moisture till after crystallization is complete, or nearly so.

If we can at such a time of year raise the temperature of the slab above the dew point, say even to 65°, but not so high that the reaction is interfered with, a fairly satisfactory mix may be made, but if the reaction must be seriously interfered with it is better not to attempt the operation. Sometimes the difficulty may be overcome by performing these operations when we start work in the morning, as the humidity will not be so great then as it will be later in the day.

Dr. W. V-B. Ames of Chicago deserves the credit for having worked out these nice points regarding temperature, and he suggests that every dentist should have a hygrometer, or wet and

dry bulb thermometer in his office, especially for use in the summer months. He has also worked out a simple form of slab which consists of an ordinary Blake bottle with a thermometer inserted in it, and the bottle filled with water. This can be kept ready for use at all times at the correct temperature or very near to it, by keeping it in a porous cup or ordinary flower pot filled with water. The evaporation of the water from the porous cup keeps it at a temperature about ten degrees below that of the room, so you have only to dry off the slab for use and you have it ready and scientifically know that it is at the proper temperature.

As regards the mixing of the silicate cements, it may be said that any of them can and I believe should be mixed quickly, the necessity for a gradual incorporation of the powder into the liquid does not exist as in the oxid of zinc or copper, the point is to get into the liquid quickly as much of the powder as it will take up, bringing it to a thick putty consistency past the stage where it shows an inclination to curl up under the spatula and an agate spatula should always be used, then on to the point where it is so thick that it shows an inclination to follow the spatula on being patted but does not do so. It is then ready for insertion.

Everything should be ready for the operation, rubber dam adjusted, and in proximal cavities good separation obtained. • The material should be forced well into the undercuts, and over the margins, then brought quickly to place with a clean dry celluloid strip, which should be held steadily for a couple of minutes when it can be removed without disturbing the filling.

Some operators do not use the matrix, and endeavor to finish the filling to the margins and all over while it is still workable, then tapping the tooth to bring the moisture or liquid to the surface and produce a finish. This is scientifically wrong. If a proper mix has been made there exists a correct balance between powder and liquid, which should not be disturbed; if it is the filling will suffer later for this procedure.

On removal of the matrix the filling should be covered with cocoa butter and allowed to remain undisturbed for about five minutes, after this it may be finished with fine strips, always drawing them towards the margin, and using a little cocoa butter on them.

To lay down a universal rule for the use of all the silicates

is impossible for we find that they act differently as regards working qualities. Synthetic and Harvidid set more rapidly than Ashers, or Berylite, so it behooves us to study the directions as furnished by the different manufacturers, and not consign them to the wastebasket when we open a package.

In cervical cavities the gum must be forced away for a day or so clear of all margins. If a clamp and rubber can be used, it should be applied, if not try to use a clamp alone, which sometimes can be done when it cannot be used with the rubber. Cauterize the gum with trichloroacetic acid to prevent seepage of moisture, and I have sometimes found painting it with chlorapercha afterwards useful, helping to keep moisture away for the time of the operation and setting.

Before removing the rubber dam, cover the filling with paraffin, or wax or the varnish furnished by some manufacturers, and instruct the patient not to disturb it for at least a couple of hours, then deprive yourself the pleasure of showing the finished filling to the patient, and saying, "Now you see you can hardly find the filling." This may save you the embarrassment at a later date of their not being able to find the filling, but for another reason, or of their being able to find a very poor excuse for a filling.

As regards instruments, ivory is the best material, bone instruments made from an ordinary knitting needle are very satisfactory, and inexpensive, and plenty should be at hand during the operation to avoid delay of cleaning in a hurry and possibly picking up some dirt which will spoil the filling. Silicates while in the plastic state are very susceptible to the least particle of dirt or discoloring matter. Steel instruments I consider barred; tantalum has some dangers in spite of the contentions of some manufacturers, and to prove this to yourself draw a tantalum instrument across a fine strip and see the result. I believe that either steel or tantalum if used in a pushing movement and not a burnishing one might be used, but the danger is so great of the latter use in inserting a filling that the safest way is to avoid them altogether. The most absolute cleanliness during the insertion of the filling is essential.

In cavity preparation follow the ordinary rules of good undercut and when you think you have enough, get a little more. Don't bevel enamel margins as for a gold filling or gold onlay, but leave

them as square as possible, avoiding the danger of thin margins of the filling material which may more readily chip off.

Personally I am only enthusiastic about the silicates in proximal cavities in the anterior teeth, which have not got much lingual extension or incisal destruction unless used in combination with gold inlays. Also in cervical cavities in incisors and bicuspid which do not extend much if any below the gum margin.

In cavity preparation it is of the greatest importance that no particle of discolored dentin be left in the cavity; if it is its presence will be exaggerated and unmistakable after the insertion of the filling, much more so than with any other material.

The combination of the gold inlay with the silicate cement facing opens up an interesting esthetic possibility for these cements.

This combination is indicated in cavities in the anterior teeth with incisal destruction, and lingual extension, also in cervical cavities especially those with deep extension below the gum margin.

In preparing the inlay for the silicate facing, the model is made with wax in the usual way. Before final removing of it from the cavity, with a sharp pointed instrument mark in the wax model just where you want the cement to come, in incisal cavities preserving carefully the cutting edge of the wax model. Remove the model from the cavity and make a small mix of Taggart's investment compound, and invest the model without sprue attached, leaving the part of it exposed where you have already marked for the silicate facing. After the investment has thoroughly set, it can be taken in the hand, and with a sharp instrument or suitable bur you can carve out the cavity in the wax which is to hold the silicate cement facing. After finishing this the model is ready for the sprue, which can be inserted carefully without marring any edges. Place the invested model in cold water for ten minutes, remove and invest in the usual manner and cast.

After the inlay has been set the silicate filling can be inserted in the cavity formed for it.

Inlays for cervical cavities can be prepared in a similar manner to receive a silicate filling, which should be inserted before the inlay is set.

In making the wax model for these cavities, the operation can be simplified by taking a stick of wax and heating it at one

end, then forcing it into the cavity after it has been chilled and removed make a model of the cavity by pouring soft cement over this impression. In this model the wax can be formed from which the inlay can be made and finished ready for insertion at the following sitting.

This process will often obviate the necessity of forcing the gum away before getting an accurate impression.

It was recently suggested by Dr. Pyper of Pontiac.

I will pass around some typodont models, two of which were kindly loaned to me by Dr. Pyper, and show several teeth with cavities first restored with the royal metal, and then in a second model the same teeth some restored with a combination of gold inlays and silicate cement facings, and some with silicate alone.

In another model I have formed two cavities such as would call for large restorations by gold inlays. These I have made in such a way that the greater part of the gold exposed to view can be replaced with a silicate cement filling.

Now I believe that there is no operation in dentistry in which a full measure of success can be obtained without absolute attention to detail, and there is no place where this saying is more true than in relation to the use of these silicate cements.

It is also essential in order that we may be in a correct mental attitude towards the operations, confident in its permanence and success and properly nerved to demand a commensurate fee. You will pardon this injection of a commercial aspect of the subject, but it seems to me practical and important and therefore not out of place. This class of work if it is to be successful takes time, skill and expense on our part, and should not be looked at in the light of a temporary operation, and therefore should demand a suitable reward.

I have been asked by patients, "Is this a permanent filling?" My reply has generally been, "It may be as permanent as many a gold filling, but even if it is not I would prefer to have you, and I am sure you would prefer to have yourself temporarily beautiful than permanently hideous."

In conclusion let me say that if my paper or the subsequent discussion brings out any points of interest or information to any of us, I shall feel more than rewarded for whatever effort it has cost me, and amply repaid for my labor of love.

FURTHER AGE CONSIDERATIONS IN PROSTHETICS.

BY DR. W. C. DALBEY, DU QUOIN, ILLINOIS.

The writer believes that there is not enough care and thought exercised in the proper setting of artificial teeth, especially in the making of dentures. And he believes that the practitioner is not altogether to blame for this error. The designers of the teeth which are upon the market have generally taken the young ideal tooth with its sharp perfect cusps and deep well defined sulci for their models. They apparently did not realize that these teeth were not to be made for young people but rather for the middle aged and the old. Now the writer believes there is not enough consideration given regarding the age of the patient when making his artificial dentures, because there is quite a difference between the general inclination of the plane of occlusion between that of the young and the old, and also quite a difference in the jaw movements. In the young, before the cusps of the teeth have been perceptibly worn, taking the lower set for illustration, we find the buccal cusps of both bicuspids and molars higher. This necessitates a tipping inward of the occlusal surfaces of these teeth. We attribute this tipping to a conformity to certain lines that enter into the occlusal plane (known as compensating curves, or curves of Spee). This is the ideal setting of the bicuspids and molars at the age of twenty. As the individual grows older of course the cusps, especially the buccal cusps upon these teeth referred to, become worn until finally they are entirely obliterated. At the age of forty-five or fifty we will find instead of the buccal cusps (still referring to the lower teeth) being higher than the lingual cusps they are just the opposite. They are all lower. The diagram herewith shown is drawn through the first molars showing graphically their inclinations at different ages. (Fig 1.)

The writer has observed when attending dental conventions where artificial teeth dealers display their wares, their demonstrators will have cases set up, in perhaps the ideal manner, to show how beautifully their teeth occlude, no doubt they do. But practitioners very seldom make artificial dentures for very young people. They either do not know, or else they forget entirely, that forty or forty-

five years is about the average age of the patients who require artificial dentures. At this age the buccal cusps of the natural teeth are considerably lower, as we have already stated.

Still referring to the lower jaw, beginning with the central incisors we find the narrow incisal plane of these teeth tipping forward and downward. The reason for this is because they slide against the upper central incisors whose planes, beginning with the

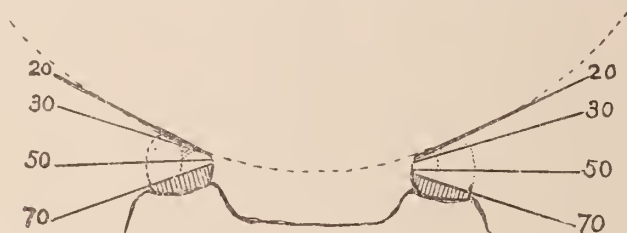


Fig. 1.

This shows diagrammatically, the inclination of the wear of teeth, through the first molars. Up to 30 years there is scarcely any wear, but when the enamel is worn away the wear is more rapid, until at 70 years the first and second molars are worn nearly to the gingival, buccally. In this process of wear the pulp recedes.

incisal edge, are upward and backward toward the gingival. Coming to the cuspid we find the cusps quite obliterated. However, there is not quite that tipping upon its incisal surface that we find upon the central incisors. Coming to the bicuspid, whose occlusal surfaces formerly tipped lingually, we find their buccal cusps badly worn until their occlusal surfaces tip slightly outward. The first molars are worn nearly flat, and the buccal cusps which were once higher than the lingual become very much lower. While the second molars are not so pronounced in this change as the first molars, they nevertheless tip outward, whereas they once tipped lingually. The third molar becomes almost level whereas it also tipped lingually. Now of course the reason for this radical change, has been principally, wear. And the wear has brought about a change in the condyle path, and oscillating points of the mandible. The condyle path becomes straighter. The compensating curves, antero-posteriorly, become less pronounced. But the alateral movements of the jaw become more pronounced.

Let us notice for a moment what movements cause this mechanical abrasion of the teeth. In the very young we will not see nearly the side motion in masticating that we see later. And the

older the individual who has his natural teeth the greater the movement of the jaw in mastication. The reason for this is, the cusps becoming worn away, there is a freer and smoother movement. In the very young we will not see the lateral movement exercised to any great extent. There is that chopping of the food into large pieces rather than the grinding into smaller particles that is seen in the older individual. There is a bolting of the food by the young that we seldom see in the old who have their natural teeth. This grinding is similar to the respective results of a coarse and a fine file. The coarse file works more rapidly, with the fine file it is less rapid but finer filings. Nature, in the young with their vigorous constitutions and copious alimentary secretions, will take care of this poorly masticated food. But the millstones of the older with their shallow serrations upon its triturating surfaces grind less rapidly and finer, resulting in better insalivation, so that the secretions of the mouth and stomach can better care for the food.

In setting artificial teeth, the articulators upon the market are not made to describe the movements of the jaw that are found in patients who need artificial dentures, but rather conform to the lines found in the young with their slight lateral movement. In the middle aged and old the movements in mastication are quite different. Instead of a swinging movement merely there is a side movement of the whole jaw toward the working side, first downward, then a gathering of the food upon the surfaces of the lower teeth, and then a pressing upward of the food upon the buccal half of the upper teeth, a pressing together of the teeth, and a drawing inward. This movement is almost parallel along the whole side and causes a decided wearing of the lower buccal cusps, finally lowering them as we have already stated below the line where they were formerly.

The writer contends that artificial setting of the teeth should conform to this principle, that is, if you are making artificial dentures for the middle aged or old, grind the teeth to conform to the natural teeth that we find in those of that age. And if a partial set of dentures or bridge work is to be inserted in the mouth a good rule to observe is that the cusps of the artificial teeth be no more pronounced than the natural ones in the mouth.

The writer knows of only one articulator that will describe the movements found in patients needing artificial dentures. It is herewith illustrated. (Fig. 2) Its peculiar construction will allow of the parallel side movements that are found usually in patients of forty or past. To accomplish the best results one must transfer the identical measurements of the human jaw, for which the dentures are to be made to the adjustable articular. One cannot

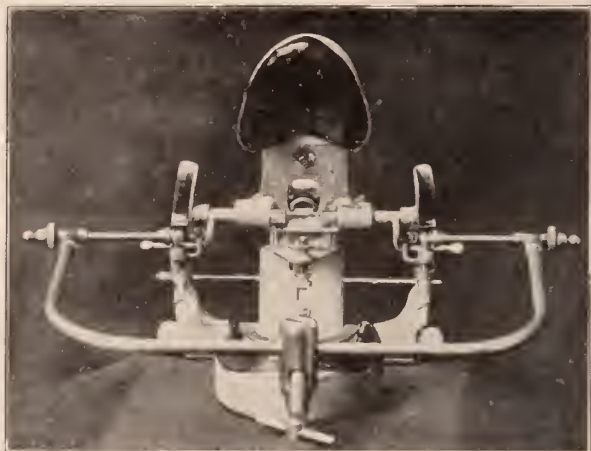


Fig. 2.

hope for the results for which this paper appeals from an articulator which gives average measurements only.

These measurements are but four: First, the distance between the centers of the condyles, which may be taken with thimble pointed calipers just back of the lobes of the ears and pressing snugly inward upon the necks of the condyles; second, the measure from the condyles to the central incisors with the face bow; third, the proper mounting of the trial plates according to the occlusal plane of the patient; fourth, the proper inclination of the artificial fossae to correspond with that of the patient. With care this may be accomplished by the usual protrusive bite method, or better still, with a condyle register.

The best teeth, according to the judgment of the writer, that come the nearest to the principles advocated in this paper, are the new True-to-Nature Teeth—made by H. D. Justi & Son. But these

teeth should be set according to the recent ideas of anatomical articulation. And after conforming to the principles of anatomical articulation in the setting of these teeth some grinding may be done, then make an articulator out of the patient's jaw when the plates have been inserted. Use carbon paper and carefully grind the teeth to conform to the movements of the jaw itself. If the buccal cusps of the lower appear too flat take a very small oval or pear shaped stone. Grind indentations in the cusps to conform to those depressions found in the natural teeth of the middle aged. If done properly it is surprising to see how much better the plates stay in position and how much better they can actually masticate food. Considerable skill should be exercised in this operation. The writer does not wish it understood, however, that he advocates grinding the teeth as smoothly as the natural teeth that are found in the mouths of some aged patients. This article is rather an appeal for a greater consideration in setting of the teeth according to the correct inclination of the teeth, and certain movements in patients of the age needing artificial dentures.

ANESTHESIA AND SHOCK.*

BY C. F. B. STOWELL, D. D. S., CHICAGO.

Whether it be the subject under consideration, or any other that induces a dentist to give up his time to read or listen to, there is one sad fact to relate; there is so much chaff that has not been purged from the wheat of dental literature that there is a lack in the profession of a conception of the classical. If a cleaning were completed and you and I were presented with the facts that are really worth while, don't you think a small volume would contain them?

We should develop a faculty for really reading and re-reading that which is classical in dental literature. We are marks for the salesman because we have such an inordinate desire for the latest. We should wait until things ripen. Somebody in Shakespeare has said that "Ripeness is everything." By ripeness and by

* Read before the Peoria County Dental Society, Peoria, Ill., March 6, 1914.

classical in our literature, I have in mind those books and ideas that have lived long enough to make their calling and election sure.

Some devotee of the up-to-date may take exceptions to that, but let us remember that God gives his gifts in ever varying forms, and the hard row of genius comes because the mediocre are always looking for something just like something else. Something seemingly just as good.

The first and greatest duty of the dentist who aspires to to successfully administer anesthetics is to become acquainted with the real literature of the subject. Among the books that are worth while are those of Buxton and Hewett.

I must explain at this point my conception of the word practical as regards the subject in hand. As we are in the habit of defining it, the practical means the immediately useful, or that which is put to use more in a manual sense than in a mental sense. By practical I mean a very thorough preparation in all that is known to be true of anesthetics. All the theories by men of science who have made the subject a life work and are going to use their findings for our good, should become familiar to you by earnest reading and careful thought. When this is done conscientiously we may be said to have a reasonable assurance that a good foundation has been laid. The superstructure will be steady and strong only in proportion to the foundational preparation.

I wish to deal with three closely related subjects, namely: general anesthesia, local anesthesia, and shock. Under the head of general anesthesia I would divide the agents into the two classes. Agents that are lipoid solvents and agents that are not lipoid solvents. To the former belong such anesthetics as ether, chloroform, ethyl chlorid and the proprietary, but widely advertised compound, somnoform. To the latter belongs nitrous oxid. The reason for making this classification is for the purpose of considering the physiological changes induced or the way in which the agents named produce anesthesia.

As in anatomy and physiology all study and interpretation has been reduced to a consideration of the cell as the unit of activity, the unit of irritability, the unit of growth and the unit in short of all manifestation of life; so today, we are considering the cell for

deeper explanation of anesthetic phenomena manifested by the action of various anesthetic agents. So that as all physiology is now cell physiology and all anatomy now histology, so all anesthesia is primarily cell anesthesia. The cell is the elementary unit of all tissues. It is the primary unit of the organic world both anatomically and physiologically. Every manifestation of life whether normal or abnormal may be referred to the cell.

The cell consists of a gelatinous substance termed protoplasm, a nucleus and a surrounding cell membrane. The latter is permeable to water and watery solutions of inorganic and organic salts. But this permeability is capable of being rendered variable, a significant fact for our present interpretation.

Considerable difficulty confronts the chemist in determining the chemical constituents of the cell. The methods used destroy the vitality and it is hard to determine whether the substances found are end products, or cleavage products or food or cell constituents. The results, however, are water 75% ; solids 25%. The solids are globulins, lecithin, chlesterin, lipoids, carbohydrates among the organic; and potassium and sodium salts, and calcium chlorid and phosphates among the inorganic salts.

A short review of the cell and its properties may help in the explanation of the theory of anesthesia. All cells possess three fundamental properties—growth, nutrition and reproduction. New born cells are extremely small but in consequence of organization and favorable surroundings they increase in size until they attain the characteristic magnitude of their own kind. This is growth. Nutrition is the power possessed by the cell to take from the surrounding medium nutritive material and to assimilate it. It also includes the process of dissimulation. These terms are usually spoken of as anabolism and katabolism and the two together as metabolism. When these processes are being carried on functionally correct the cell is in nutritive equilibrium. In addition to the above properties all living bioplasm is characterized by irritability, conductivity and motility.

The power of reacting in response to stimuli, whether chemic, mechanic or electric constitutes what is called irritability. The reaction being, up to certain limits of greatness of the stimuli, in proportion to the stimuli and acting only during a period short of

exhaustion. Nerve cells and nerve tissue possess this character in a highly developed condition. But other cells possess it and the tissues respond to stimuli with their characteristic function; thus a glandular irritation results in increased secretion, a muscular irritation results in contraction, etc. Conductivity as the term itself implies, means the transmission of disturbances. Nerve cells and tissues are highly specialized in this regard.

The outer limiting membrane or plasma membrane plays an important part in the activities of the cell. Its permeability being of a variable character acts as a protection against stimuli under certain conditions. The lipoids and colloids of the plasma membrane form the vulnerable part to toxins, trauma and other sources of irritation. Any change in these lipoids and colloids by whatever agencies, produces marked changes in the irritability of the cell. The lipid solvent-anesthetics and others possess a marked anti-stimulating effect on the cell, and in consequence of this the tissues made up of these cells are made irresponsive to the various forms of stimulation. It might be well to interpolate at this point that this subject of cell irritability has peculiarities that we might use for a very practical purpose. It is known that solutions of too high a concentration result not in the desired way, viz: that of making the cell not only irresponsive to stimuli, but in cytolysis or dissolution of the cell. In this may be found a fairly good definition for anesthesia as distinguished from death. Anesthesia is the reversible loss of irritability, whilst death is the irreversible loss of irritability. Now on the other hand solutions of too weak a concentration often will result in increased irritability. A concrete illustration of this may have occurred in your office when the apparatus for administering nitrous oxid became defective and large percentages of air were unintentionally mixed. It is needless to draw a word picture of the scene, especially if the patient were of the irritable type. The irritability was increased as you doubtless remember. The present time theory of anesthetic action seems to be that of changes in the cell membrane or plasma membrane of the irritable tissues. Trauma, toxins and functional impulses sent from the center working alone seem to increase the permeability of the cell membrane. There is a normal resistance, however, to this increased permeability, a sort of self protective measure on

the part of the cells. This resistance is increased by the action of anesthetics. Or, in other words, the permeability increasing action of the stimulating agent is effected by the changed state of the lipoids and colloids, in the plasma-membrane, as they are altered by ether and chloroform on the one hand, and nitrous oxid on the other.

The cell in consequence of the action of the anesthetic is rendered irresponsive to stimuli, and the tissues made up of these cells are deprived of the property of irritability.

The fact that there are great chemical differences between the lipid solvent and non-lipoid solvent anesthetics, will undoubtedly show as marked physical changes due to their respective actions. But until these are worked out we must depend upon our clinical experiences with them. Both produce anesthesia. The lipid solvent group have a more profound effect and with even the lighter members of the group as ethyl chlorid the duration of narcosis is longer after discontinuation of administration than with the nitrous oxid. Then again we are able to produce relaxations in all cases with the lipid solvents, whereas this is impossible with nitrous oxid in many instances. We must use in our work the anesthetic that is adequate for the case in hand. To illustrate: Most cases of extraction can be taken care of very well with a general anesthetic such as nitrous oxid or a local anesthetic such as novocain, but occasionally we are confronted with what might be denominated as a major extraction—an impacted tooth. In these cases where the location is such as to necessitate a great deal of time and care in the removal I am much in favor of the case being taken to the hospital and having my patient anesthetized by the specialist in charge of this work. This is my conception of adequate anesthesia. It consists of the proper agencies, viz: The correct environment, the hospital; the drug, preferably ether; and the exclusive attention of the right person—the specialist in anesthesia. Working under these circumstances a major extraction loses many of its terrors to the dentist.

It is not my intention here to detract from the value of nitrous oxid. But we cannot be just to ourselves, if we do not acknowledge its short comings. As to safety, nitrous oxid stands highest. The same can be said of its convenience and

expediency. If you need, however, a deep even anesthetic you must needs call upon ether.

The apparatus for administering nitrous oxid should be of a very simple character. The reason the man who prepares his gas from the nitrate of ammonia in his office every day has such good results, lies, not so much in the quality of the gas, but in the even and ever dependable flow of the gas from his storage tank to the inhaler. The nearer the manufacturer can approach the automatic action of such an apparatus the better pleased will be the dentist who buys, and the better service will the patient receive. The pressure reducing devices of the various machines now being placed on the market are a step in the right direction. The perfect apparatus will not and must not divert the attention of the anesthetist from the patient.

The use of oxygen in conjunction with nitrous oxid for producing narcosis is a delusion. It is the stumbling block that causes a great many failures. Our literature is full of the percentages of oxygen to give and I want to say, that from some experience at least I have use for no cylinder oxygen. This might not be true if we had a perfect machine. The defects in inhalers and valves have given our patients enough oxygen in most cases to do away with the necessity of cylinder oxygen turned into a bag expressly for the purpose of giving percentages. I'll grant that if you enclose your patient so that no oxygen can get to his lungs you will soon have him in a dangerous condition; but you don't so enclose him and consequently he gets atmospheric oxygen sufficient to the anesthesia demanded in short operations. If the prolonged administration be essayed you should give oxygen either from cylinder or air in such proportions as will meet the exigencies of the case. To lay down a rule of percentages is simply assuming that there is something about patients mathematically correct and exact and undeviating, an assumption at once preposterous and ridiculous. My advice would be—spare the oxygen, at least in the early stages. Further in regard to the subject of oxygen in nitrous oxid anesthesia—the type of patient must be considered before starting the administration. Use no oxygen in the early stages of anesthesia with the vigorous, high lighted type represented very con-

cretely in certain Irish and French. In anemic people you must use oxygen in increasing proportions as the period is prolonged.

In a great many oral operations, particularly the extraction of teeth where more or less roughness is used in consequence of the resistance of the tooth to removal, the anesthesia is very apt to be interfered with by what are called inter-asphyxial symptoms. Oxygen from cylinder or air is here indicated until the convulsions and cyanosis have disappeared when the nitrous oxid may again be administered. During such periods of interference it is quite necessary that the blood be sponged from the mouth and that the patient be kept in a position bolt upright, thus preventing blood from lodging in the pharynx and making the conditions worse by absolutely stopping the ingress of air to the lungs. The operations of extraction should be performed with as much gentleness as possible to avoid these symptoms. And I must add a caution right here, concerning the mouth prop. On account of a lack of muscular relaxation, no one should presume to administer a nitrous oxid anesthetic without having a mouth prop in position from the beginning. In an unrelaxed condition, it might be necessary to have access to the mouth to draw forward the tongue in case of respiratory embarrassment.

SHOCK—There is a far more important reason for not manipulating tissues roughly under the anesthetic. While the anesthetic can avoid psychic shock the traumatic shock is present and not prevented entirely. Experiments by Dr. Crile have proved this and brought upon him anathemas from the Antivivisectionists. As they say in a circular, "In an endeavor to learn the extent of agony that can be inflicted on a living animal." They leave out of the circular all mention of anesthesia. Was that intentional?

Well, to return—As response to stimulation is one of the fundamental attributes of all living normal cells and tissues, so exhaustion and lack of response would be a corollary to the first proposition in a case where the agency of stimulation were applied for too long a period. Traumatism, chemism and psychic influences are among the commonest agents of stimulation. The increased activities of cells or tissues are self protective measures. These efforts to escape or to protect may result in exhaustion.

If the point of exhaustion is reached we have a condition known as shock. Then we deduce from this the definition for shock: Shock is a result of stimulation of cells or tissues to the point of exhaustion. The results of shock producing agents are marked upon the protective organs, the muscles, the thyroid, the brain and adrenals. Dr. Geo. W. Crile has announced some very interesting data upon the subject of traumatism without anesthesia and with anesthesia. Under nitrous oxid anesthesia he says that we have with the same amount of traumatism about one third the brain cell changes that occur under ether.

Under ether, chloroform, ethyl chlorid, etc., the brain is not protected but under nitrous oxid it is. This is because the disconnection of the current in nitrous oxid anesthesia takes place in the afferent path not after the stimuli have reached the center, while with the lipoid solvent group the break in the arc is in the efferent path. This makes a clinical fact easily understood, because we know how comparatively few cases of shock are the result of operations performed under nitrous oxid anesthesia. I might say we have practically none. The cases you have, have resulted from imperfectly anesthetized patients or from the fact that you have operated to extract a root after the patient had regained consciousness. That is you stimulated the organism to the point of lack of response. The prophylaxis here indicated is the avoidance of long severe operations. The recognition of the cause of shock will go a long way toward lessening the number of instances in surgical practice. In fact I am so well satisfied on this particular point from my private practice experiences and my experiences in the great extracting clinic of Northwestern University during the past six years that I believe this distressing and dangerous condition can be almost entirely eliminated.

There has been great advancement along the line of local anesthesia. The discovery of the synthetic product, novocain, in 1905, marked one step in the progress. This drug has almost supplanted cocain, and from the results obtained it should, being according to German authorities, one-seventh as toxic as cocain, being sterilizable, producing equal degrees of anesthesia, and being followed by equally as quick recovery of the parts infiltrated. There

can be no longer an excuse for the use of cocain when such an admirable substitute is at our disposal. But with all its good qualities, results may be lacking if the proper technic is not followed. A close study of the writings of Dr. Prinz on this subject will be beneficial.

I had not purposed writing anything concerning the use of local anesthetics but when I think how important a part of a dentist's work it is to perform his operations as painlessly as possible. I didn't think my duty done until I included something on this branch of anesthesia. The importance will at once become very apparent in view of the fact that with proper technic traumatic shock is an impossible condition with novocain, a statement not possible to make about nitrous oxid, ether, or any general anesthetic. The only proper use to make of an injected anesthetic is such that in consequence of its use afferent impulses are checked. These impulses may be checked by what is termed nerve-blocking. This consists of infiltrating the nerve at a point between the part to be operated upon and the center. If no afferent impulses are conducted to the center the conversion of potential energy to kinetic cannot occur. As long as a physiological amount of potential energy is converted into kinetic no harm results. The potential energy may be likened to a large stone placed high on a wall and capable of being precipitated. Some external force dislodges it and its potential becomes kinetic energy. If it falls all the way to the ground it loses all its energy, both potential and kinetic. If, however, it catches part way down it will retain part of its potential energy. With the cells of the body the same holds true, if they have expended all their potentialities or nearly all they may be said to be in a condition of collapse or partial shock, as the case may be.

Now the local disconnection of afferent nerve impulses prevents the conversion of the potential energy to kinetic at the center, which may result in respiratory paralysis or heart failure.

For our purpose as dentists, the teeth of the lower jaw from the central incisor to the third molar inclusive can be operated upon in any way without the slightest pain and without shock by blocking the inferior dental nerve by infiltration at the foramen entering the inferior maxillary on the interior of the ramus. This constitutes the only practical and feasible use of nerve blocking

in our profession. That the upper teeth may be cut off from communication with centers by infiltration is possible but not practical. The difficulty of reaching the gasseron ganglion makes it a dangerous procedure and not one warranted, because good results in local anesthesia may be obtained by the ordinary means. It is useful to use nerve blocking where we must deal with abscessed teeth. In these, we do not get adequate anesthesia by the ordinary methods of injection.

Summary—The use of cylinder oxygen may be dispensed with in anesthesia for the extraction of teeth.

For major extractions, ether seems to me the adequate agent for anesthesia.

The avoidance of shock by not unduly prolonging the operation seems better than any treatment of shock after its occurrence.

Local anesthesia and nerve blocking may be used to far better advantage by us if our technic were made more nearly perfect.

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THE NEW DENTISTRY.*

BY EDWARD H. BAKER, B. A., M. D., CHICAGO, ILL.

In the evolution of human understanding, we find that the first manifestation of a dawning intelligence is to do something, to make something. A little child is delighted with its first efforts. The savage feels great pride in his crude implements, pottery and decorations. But his most finished efforts compare with those of the skilled artisan of civilization about as sloyd compares with manual training. One is the cut and try method and its results are inac-

*Portion of President's Address delivered before the American Institute of Science, Chicago, Ill., at the Convocation Exercises, March 30, 1914, when the members of the First Dental Study Class received their degree of "Member of the American Institute of Science." Members of Class receiving degree were: Drs. Henry H. Schuhmann, Frank H. Skinner, Sydney J. Knowles, Lester F. Bryant, Lee K. Stewart J. E. Hinkins, Geo. W. Pitts, J. A. Burrill, Austin F. James, W. G. Clark, L. L. Davis.

curate and irregular; while the other is a definite procedure done by rule and characterized by regular form and close-fitting joints.

But with the growth of civilization and increase of knowledge, the idea of *not* doing certain things attains increasing importance. This is peculiarly true since knowledge has begun to assume scientific form and adopt scientific methods of measurement and investigation.

With the advent of science, the myths of the past began to vanish like mists before the sun. Knowledge of the real facts has revolutionized our ideas on most subjects. Procedures which were considered most desirable in accordance with myth and tradition were found to be most undesirable when the light of knowledge revealed the facts.

Dentistry offers no exception to this rule. Within the past ten years, research in bacteriology and pathology have cleared up much of the sequence and mode of action of disease in the human body.

While as yet we are ignorant of many facts, evidence is fast accumulating which points to the mouth as, perhaps, the most important focal-center of infection and disease within the human body. With the growth of this idea, the profession of dentistry suddenly appears in a new rôle. Instead of being of subsidiary importance, it appears to be of primary importance, and instead of being a calling wherein only mechanical skill and ingenuity are required, it appears to be a profession requiring deep scientific knowledge, not only of the human body and its processes, but of organic and physical chemistry and physics.

There are scarcely any dentists or dental students who realized this fact when they began the study of dentistry. And up to the present time, there has been so little appreciation of the tremendous responsibility for human life and welfare which rests upon the shoulders of the dentist, that dental schools have not yet been able to extend their curriculums to include such medical teaching as will fully enlighten the student as to the injurious and far-reaching effects of poor dental work.¹

¹See "A Look Ahead," Editorial by Dr. Edward C. Kirk in the *Dental Cosmos* for April, 1914, 56, 4, p. 497, showing the urgent need of such additions to the curriculum of the Dental School as will span the field between dentistry and medicine.

Natural contour and contacts, smooth joints, close-fitting bands and even clean teeth—how often are they neglected? Yet we learn that pyorrhea and abscesses, whether open or blind, cause rheumatism, valvular heart-disease, Bright's disease, arterio-sclerosis, liver disease, gallstones, appendicitis, nervous diseases, digestive disorders and nearly all of the chronic ailments that flesh is heir to.²

The dentist who makes a poorly fitting crown is, in reality, placing a crown of death upon his patient. Thus the advertising quack, with his \$3.00 or \$5.00 gold crown, is really a stealthy assassin who, under the guise of saving money for his patient, administers to him a death potion which is as sure as it is slow and unsuspected.

All this is the result of ignorance. The spread of knowledge and of education will do away with most of our ills. While education or training cannot make a good mechanic of one who is entirely lacking in mechanical ability, it can enlighten him and others as to the terrible results of poor work. This knowledge will show him what to refrain from doing, no matter how clumsy he may be with his hands.

Thus even an awkward, poor workman, with little or no mechanical skill, may be led by knowledge to either mercifully abandon his mistaken choice of a profession for one in which he will be less likely to do harm, or else to limit his efforts to operations where he will not injure the health and life of the patient.

Thus we see that the effect of scientific knowledge is to teach us what not to do, even more than what to do. Interference with nature's life processes is dangerous. It is slowly percolating into our minds that from a standpoint of life and health, while fine dental work is of the greatest value to man, poor dental work is a great menace. Instead of the dentist being merely a mechanic, he is a man who is responsible for the lives and health of the inhabitants of the civilized world.

The students of the American Institute of Science are now equipping themselves with knowledge which was omitted in their

²"The Natural Field of Dentistry," by Edward H. Baker, M. D., *Dental Cosmos*, June, 1912.

In this article is a list of over 100 diseases which have been shown to originate in the mouth with a bibliography of same.

earlier training, but which has suddenly become imperative, in the light of the new information as to the causation of disease. This means that those students who have had the training which is given in this Institute, will inevitably become the dentists who hold the confidence of the public, whether dentists, physicians or laymen. And the degree of "Member of the American Institute of Science" will be the honorable badge of those who are better equipped to serve humanity than are those who have not had this kind of training.

There is another consideration which we must not forget. While teaching as to the far-reaching, injurious effects of bad dentistry is being neglected, so is the teaching of the wonderful curative effects of good dentistry being neglected.

Dentistry is affected in two ways by these omissions. First, the dentist does not realize what great good he is doing his patients and, secondly, as a direct result, the patient must remain in ignorance of the real value of the dentist's services.

To explain my meaning, let us take a concrete example.

A patient comes to a dentist. His mouth is in very bad condition. He is unable to chew, has pyorrhea and a very foul mouth. He is pale and emaciated, has digestive disturbances, perhaps stiffness and rheumatism and many other symptoms.

The dentist puts his mouth in first-class condition. The patient gains 20 or 30 pounds, feels like a new man and pays the dentist his fee. This dentist may or may not get other patients through this patient or his family.

Here is where dentists make a fatal blunder. They do not diagnose (or have someone else do it for them) the exact physical condition of their patients before and after the dental work is done.

Is the patient anemic? Make a blood count and find out. A blood examination made after the dental work is finished will prove the wonderful change which has occurred. Has the patient chronic Bright's disease? Take his blood-pressure and examine the saliva and urine and find out. Then, after the dentist has completed his work, let him show by successive examinations, made every month, the steady improvement in the patient's condition. He may get entirely well.

Has the patient diabetes? Make a urinalysis test and find out. Then make subsequent tests after the pyorrhea is under control and show the diminution of sugar. It may disappear entirely and permanently.

Has the patient a very high blood-pressure? If subsequent tests taken after the dental work is completed show a marked reduction in blood-pressure, it means that the bad mouth condition was causing arterio-sclerosis (hardening of the arteries) or Bright's disease, and that the dental work is going to lengthen that patient's life by many years. These patients will talk freely and convincingly to all their friends.

Will the physician object? Not he. As soon as he finds that the dentist knows how to make diagnostic tests even more accurately than he does and is making them on all his patients, he will pay some attention to what the dentist says, because the dentist now speaks in terms of facts, not vague generalities.

Instead of saying the patient was "run down" or "in bad shape," or "complaining of ill-health," the dentist says:

"The systolic blood-pressure was 159. It is now 128.

"The diastolic pressure was 93. It is now 90.

"The pulse pressure was 66. It is now 38.

"The amount of hemoglobin was 65%. It is now 94%.

"The number of red cells was 3,650,000. It is now 4,830,000.

"The 24-hour specimen of urine showed a little albumin and a number of hyaline and a few granular casts at each examination. It now shows no albumin, no granular casts and only an occasional hyaline cast."

Thus the physician will at once acquire confidence in the dentist because of his evident accuracy and knowledge of medical diagnosis. The physician will be astonished and pleased when he learns what a wonderful effect mouth conditions have on bodily health. He will at once recall cases which he wishes to send to this dentist for attention. He will begin to examine the mouths of his patients and to note pyorrhea. Soon he will be sending *all* his patients to the dentist to have thorough dental attention including prophylaxis, instead of sending an occasional one to have a tooth pulled. To which dentist will he send his patients? To those dentists whose

scientific knowledge he respects—to those who are familiar with medical diagnosis.

Thus, this diagnosis will result in securing the co-operation and respect of the physician. It will increase the demand for dental services many times in a given locality. It will necessarily increase dental fees. It will make dentistry the "Greatest Profession in the World."

The dentist is often in a better position to make a diagnosis than the physician is, for people who consider themselves well and in no need of the services of a physician, go to a dentist. And the dentist will often be led by the appearance of the gums or saliva, to suspect a physical condition unknown to the patient or his physician. In these cases as well as in those of his other patients, the taking of blood pressure and examination of saliva, urine and blood will reveal the facts regarding grave physical disorders.

The dentist who discovers incipient Bright's disease, Diabetes, etc., in an incipient stage, when curative measures will, perhaps, arrest its progress, is certainly a friend to humanity and will be recognized as such both by patients and physicians.

Thus the dentist has a natural field of diagnosis which is not occupied by the physician and he should not neglect his opportunities and responsibilities in this field.

The teaching of physical and clinical diagnosis appears to be most needed in the practice of dentistry today. For this reason, this Institute has devoted a large amount of time and effort to these subjects in the curriculum of its Dental Study Classes.

It seems to the writer that even when the dental college course is extended to four years, there will still be need of post-graduate work, because advances in science, dentistry and medicine are being made with such rapidity that a man who has been out in practice five or ten years has much to learn.

Since we have discovered that the field of dentistry is the most important one as regards the health and life of the people, it is no longer permissible for a dentist to consult his own preferences as to whether or not he wishes to keep abreast of the scientific knowledge of the day. Human life and human welfare demand that he must either do his best work, or resign and seek some other field where mediocre efforts are not so dangerous to mankind.

For the first time in the history of the world, human life is beginning to be considered of some importance. The "safety first" movement is here and is spreading. Factories, tenements, theatres, steamships and railroads are adopting precautionary safety measures, because it is slowly filtering into our minds that the terrible waste of human life is needless. It is going to be the same with sickness. Our growing knowledge as to the causation, progress and sequence of disease shows that mouth conditions probably surpass every other factor in importance.

Hence, in the evolution of human society, the profession of dentistry is about to become the most important, the best rewarded and the greatest profession in the world.

A new "Member of the American Institute of Science" said to me the other night: "Dr. Baker, my enthusiasm for the profession of dentistry has increased very much during the past year since I became a member of this Study Class. I have two little sons, and if either of them desires to become a dentist when he grows up, I shall be glad. This was not my attitude a year ago. I felt then that it was a sort of a 'dog's life,' and at that time I was not willing that either of my sons should follow in my footsteps and become a dentist. Now I feel differently about it, because the practice of dentistry has become so much more interesting to me and is offering such rich rewards for intelligent effort."

Every dentist should be proud of the privilege of being a member of the dental profession today and of taking part in its new and glorious future career which is now opening up to view. But not all will avail themselves of this privilege. Some will cling to past traditions with their lack of ideals and responsibilities.

The "dentistry of to-morrow" carries with it great responsibilities, for not only will the dentist know of the great importance of his own operations, but he will be the great health teacher. Thus, in reality, he will be the keeper of public health.

Dr. C. N. Johnson has recently called attention³ to the danger that physicians might overestimate the evils arising from bad or doubtful dentistry. (For in this transition period in medicine and

³ DENTAL REVIEW, 28, 4, April, 1914, p. 364.

dentistry, we do not yet know, or see clearly what is good and what is bad—which methods are beneficial and which are injurious.)

There is no doubt a general tendency of the pendulum to swing to extremes at first, and we cannot expect physicians or laymen to offer any exception to this rule in the present instance. Dentistry will doubtless receive some undeserved criticism. On the other hand, there is only one practical method of avoiding this criticism, and that is, to adopt the method of diagnosing cases before and after dental operations.

When physicians and the public realize how much good the dentists are doing, they will praise them instead of blaming them. At least, they will praise those practitioners who are accustomed to make these diagnoses, and who thus give practical evidence of their appreciation of the importance of mouth conditions as related to the health of the rest of the body.

I consider that at present the only safety to dentistry lies in advancing and in gladly accepting the new responsibilities which are so suddenly and unexpectedly thrust upon it. The reactionists, the more conservative practitioners, who are slow to reach a conclusion, are the ones who are most likely to call down criticism upon the entire profession.

Conservatism is the great safe-guard when it is backed up by facts; but when it is founded upon ignorance of facts it is the most dangerous, revolutionary and explosive force in the world.

There are now various diagnostic methods which are sufficiently simple and easy of acquiring a technique, so that in a short time a dentist can learn to diagnose some of the most dangerous conditions of bodily disease with comparative ease. Even if his office-girl did most of the work, he should be able to make an intelligent interpretation of a blood-count sheet, an urinalysis, or a blood-pressure determination. With a little experience and practice, he would soon attain a degree of knowledge and skill which would make the daily practice of dentistry an ever-changing field of joyful interest instead of a dull, uninteresting, humdrum round of toil, the monotony of which gets upon his nerves and takes years away from his life.

Let us welcome the advent of the New Dentistry:

POSSIBLE STERILIZING PROPERTIES OF FILLING MATERIALS.*

BY W. V-B. AMES, D. D. S., CHICAGO, ILL.

By "sterilizing properties of filling materials" it is, of course, not meant that a sterile condition of the oral cavity and its fluids can be promoted to any very appreciable extent. There is unmistakable clinical evidence, however, that there is a salutary effect upon tissue and fluids in immediate proximity to certain filling from salts formed by an inappreciable waste thereof. Our chief interest is in what may happen beneath fillings.

A state of sterility in which bacteria can not exist and reproduce, is, as a general proposition, brought about as a moist condition by embalming, and as a dry condition by mummification. The latter state may be said to be embalming perpetuated by absence of moisture after sterilization has been accomplished.

Mummification of more or less disorganized tissue beneath a filling and protected by it from the oral fluids, is best accomplished by a material capable of giving off some of its substance to help create a product of a penetrating nature, i. e., a creeping salt. If the product formed between the filling material and the exciting agents present, and infiltrated into the disorganized tissue, is such that there results a compact mass, sterile under the conditions, or even immune to destructive influences under altered conditions, the filling material with which this is possible, is valuable.

Giving publicity to work done on the efficiency of these materials would be timely, even without the present need of clearing the atmosphere because of the exploitation of various filling materials as having ultra efficient germicidal properties contrary to all rational preconceived ideas. Because of this need, the investigation has recently included some of these materials not rationally considered efficient. Being guided entirely by preconceived ideas is dangerous. In this case we will try to see whether bacteriological tests indicate that a revolution is in prospect as a result of small addi-

*Read before the Odontological Society of Chicago.

tions of copper compounds—for instance—to dental cement for general use.

While tin foil and some amalgams have shown some inherent preservative properties, it is with the cements that we must be most interested, as a freshly mixed cement offers soluble salts for immediate or prompt penetration of tissue needing some remedial effect. Oxyphosphate of Copper having established such a record as a tooth saving agent, since it was introduced by me twenty-six years ago, the name in some form has been much conjured with to describe a variety of preparations containing various proportions of various copper compounds. I will, therefore, need to have most to say about this material.

Subjection of hardened pellets to media has been of interest, but it is by the application of freshly mixed cement to agar or bouillon that we closely duplicate the placing of cement into a tooth cavity. Placing hardened pellets into bouillon or into or upon agar after a time verifies clinical observations of the comparative effect of different cements upon contiguous tissues, but freshly mixed cement placed upon the surface of inoculated agar affords a demonstration of what takes place forthwith when a filling is placed in a cavity from which all decalcified dentin has not been removed.

Having a cavity where it has been necessary to leave decalcified or semi-decalcified dentin over the pulp, this layer should be left saturated with moisture to the extent that it would be after only a reasonably careful use of absorbent pellets upon the other surface of the cavity. It is reasonable to suppose that with the application of plastic cement to such a surface, there will be a diffusion of some of the solution of the phosphate of the fresh cement into this moist layer and a diffusion of some of the moisture in this layer over the pulp, to the cement. By this interchange a powerful germicide may have entered the more or less decalcified organic matrix, and a fluid has entered into the contiguous portion of the cement mass to a slight depth, which will render that portion capable of furnishing the embalming agent peculiar to the cement used, and yielding more of it than if there had not been a modification of the area adjoining the decalcified tissue by the taking up of more water than was needed for crystallization. The results obtained after placing hardened cement pellets in media are apt to be mis-

leading because the greater the density and integrity of mass, the less readily will germicidal salts be given off.

If, for instance, the freshly mixed filling has been a real oxyphosphate of copper, some soluble copper phosphate is leached from a portion of the mass, leaving that portion porous as compared to the balance of the mass, and therefore, in condition to more readily furnish germicidal salts. With this assumption, a sterilizing and embalming of decalcified organic matrix more or less necrotic is easily explained, and there only remains to be explained the fact that the stain only extends to, and does not mass into, normal dentin.

I have never been able to give or receive any other explanation of the embalming or mummifying of the organic matrix of dentin than that there is a peculiar tendency, as shown in laboratory tests with some copper salts, to recombine into an albuminous compound, proof against the destructive influences which break down tooth structure, resulting in what we call caries.

While it is difficult to duplicate in a test tube or Petri dish the definite result seen at all times beneath a real oxyphosphate of copper filling, for instance, some convincing comparisons can be made between masses of oxyphosphate in which copper oxid has been used to the extent of nearly one hundred per cent and other masses in which a lower percentage or none at all has been used.

In a liquid medium such as a beef bouillon, a tendency to form a copper salt distinctly blue is easily seen when a pellet of high percentage copper oxid cement is placed in sterile medium, with no visible tendency when a pellet containing, for instance, fifty per cent each of copper oxid and zinc oxid, or of zinc oxid modified by smaller additions of any copper salt, is so placed. In a tube of inoculated bouillon the same blue color will appear and if extreme care is exercised to avoid agitation of the fluid medium, there will be inhibition about the pellet at the bottom of the test tube. If only a low percentage of copper compound be contained in the pellet, no inhibition or color will be noticeable.

There has been interest and profit from subjecting all sorts of hardened pellets to all kinds of media under all conceivable conditions, for the reason that we need to have an interest in the possible medicinal effects of filling materials on contiguous tissue.

There is clinical evidence of such medicinal effect without appreciable waste of substance.

Pellets of cement subjected to various media both sterile and inoculated, give evidence of their comparative germicidal potency. When bacteria will thrive throughout an amount of liquid media containing pellets of zinc oxid cements, pellets compounded of twenty-five per cent to seventy-five per cent of copper oxid with zinc oxid, with pellets of some so-called copper cements composed of zinc oxid and a small percentage of iodid of copper, and even pellets of oxychlorid of zinc, and when the media in a test tube to the level of the top of a pellet of a high per cent copper oxid cement will remain sterile and clear excepting a copper salt color, we have evidence of comparative germicidal properties.

Bouillon experiments are otherwise very unsatisfactory as the conditions differ entirely from those we are trying to explain. Agar as media offers slightly better opportunity to obtain tooth and filling conditions. Various schemes by which pellets and agar have been inoculated and brought into contiguity, have been tried. The method most nearly duplicating the tooth and filling condition has been the filling of the smallest Wassermann test tube with melted and inoculated agar to within about one-eighth of an inch of the top and chilling the tube and contents. While this agar is yet cold the cement in question is inserted in a plastic state to fill the remaining portion of the tube. A mass of cement placed upon inoculated agar in a Petri dish does not as closely duplicate the tooth and filling conditions, but the comparative inhibition is more apparent.

Freshly mixed cements promptly give evidence of the extent of inhibiting and sterilizing power resulting from the salts formed during the mix. Most important of all from the standpoint of proper understanding of what may be expected from admixture of cement making oxids is the information gained by not only an-

*It is, I trust, admissible in an attempt to clear up the situation, to refer to the contentment on the part of some manufacturers that a blend of small percentages of some copper compounds with zinc oxid to enter into an oxyphosphate offers greater advantages as a sterilizing filling than one compounded almost entirely of copper oxid. It is not considered unethical for the Agricultural departments of our State Universities to investigate the claims of manufacturers, and in doing so the names of manufacturers are mentioned.

alyzing the soluble salt produced and available for analysis in the fresh cement, and also by observing the bacteriological effect on inoculated agar and bouillon.

Chemically and for bacteriological purposes, it happens that the salt formed during the mix is at the expense of the zinc oxid, which fact forthwith removes all chance of discussion. Copper oxid properly added to a zinc oxid cement will give added integrity of mass, but when enough is added to prove of benefit bacteriologically, the color is as objectionable as if copper oxid were used entire.

The blending of zinc and copper oxids and then subjecting the mixture to the action of an acid phosphate solution is analogous to placing sheets of metallic copper and zinc in an acid solution to constitute a galvanic battery. In such a battery the solution of metal is entirely at the expense of the zinc, just as in this cement all salt formed is at the expense of the zinc oxid except when nearly 100% copper oxid is contained. It is fortunate that so simple and familiar an analogy, as the copper zinc battery cell is available as in illustration.

Any operator having observed the clinical difference of result between the use of a real oxid of copper cement and one in which copper and zinc oxids are combined, has noticed the absence of evidence of copper salts having formed during the setting of the cement made from the mixed oxids. With mixed oxids the copper salts formed after setting will be less in proportion to zinc salts than the relative proportion of copper oxid to zinc oxid in the mixture or entirely absent. Cement pellets which have hardened after being placed in the freshly mixed state upon inoculated agar, give results in conformity with those clinically observed with materials long in use, and impressive comparative evidence in cases of materials not yet sufficiently tried clinically. The agar plates with notations are self-explanatory.

In applying these cements in the fresh state to inoculated agar there is in one case the typical copper coloration with marked inhibition of bacterial reproduction, and in the other no coloration, and inhibition only to the extent that would be expected from the

corresponding zinc salts which we know from clinical observation is so slight as to be negligible.

It is easy to demonstrate that there is nothing else than the zinc salt formed in such a zinc copper mixture unless the copper content reaches so close to one hundred per cent that there is no argument in favor of the zinc oxid admixture. Chemical analysis of solutions obtained by puddling freshly mixed cement in water,



Plate 1

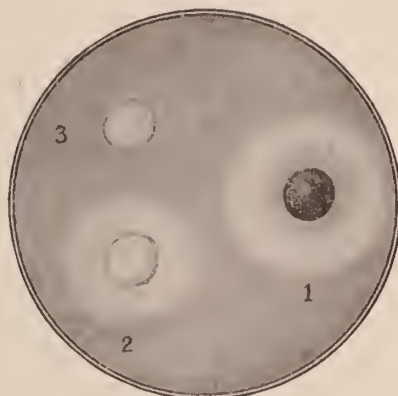


Plate 2.

Plate No. 1 illustrates typical inhibition of growth of staphylococcus by fresh mixes of a potent cement. Plate No. 2 Pellet No. 1 Oxyphosphate of copper. Pellet No. 2 Oxyphosphate of zinc containing a small percentage of mercurous iodid. Pellet No. 3 "White Copper Cement." Inoculation of agar of Plate No. 2 same as Plate No. 1. Cement freshly mixed was placed upon the inoculated agar. The shaded portion about Pellet No. 1, Plate No. 2, shows the green copper salt. These illustrations have been selected from a large number shown in connection with the reading of the paper.

easily shows evidence that metallic oxids obey the same law which governs the corresponding metals in entering into combinations. Metallic oxids, like the corresponding metals, obey the rule of electro-chemical potentiality in entering into combinations. The oxids interesting us as cement ingredients occupy relations as follows, starting with the most positive, i. e. zinc, iron, cobalt, copper, mercury, the zinc being positive to iron, the iron to cobalt, the cobalt to copper, and copper to mercury, each metal or its oxid being dissolved when subjected to acid in the presence of one to which it is positive.

Chemical analysis will show that there is no copper salt formed

*The negative element of a battery furnishes the positive electricity.

when either cobalt, iron, or zinc oxids are mixed with copper oxid, unless the copper predominates to the extent of nearly 100%. It is easily demonstrated by placing freshly mixed cement on moist blotting paper that zinc salts only are produced when mixtures of zinc and copper oxids are submitted to acid phosphate solutions. In case of the mixed oxids, after drying the paper, there will be found a white salt efflorescing at the edge of the pellet, while if it be a straight copper oxid cement there will be evidence, by color, of the copper salt having been formed and the spreading tendency is in evidence.

Although zinc oxid cement has little power to inhibit bacterial reproduction, that little is in excess of any such power possessed by the silicious cements, in which the ingredients are such that bactericidal power is entirely nil. Oxychlorid of zinc cement would seem an advisable intermediary layer beneath a silicious cement when some slight inhibitory influence is called for.

Coming now to the need of considering the so-called "white copper cement," it becomes necessary to judge of the value of an iodine compound as a cement ingredient. The powder of the "white copper cement" is composed of about ninety-five per cent of zinc oxid, and about five per cent cuprous iodid, the whitest copper compound available. Iodine is a potent germicide and yet it can not be demonstrated that a mass of freshly mixed cement containing five per cent of cuprous iodid contains enough of a potent soluble germicidal salt or enough free iodine to have any inhibitory power in excess of that exerted by an oxyphosphate of zinc, as is shown by reference to the Petri dishes containing cement upon inoculated agar for comparison.*

If a cement is porous, or if there is need of rendering it sterile within its own substance, it may be rendered sterile by containing some such ingredient as iodid of copper, but such an ingredient is not needed in a cement the texture of which is such that this internal sterilization is not called for. The impregnation of a material to be exposed to the fluids of the mouth with any such substance, I consider a senseless temporary expedient. If such a ma-

*A manufacture of "Copper Cement" in colors can be ignored as no more of any copper compound is contained than has been used in some other oxyphosphates for pigmentation purposes.

terial is intended for pulp capping or root filling of anterior teeth, there is argument in its favor, as when sealed from the direct action of the oral fluids there is reason to expect a practically permanently sterile condition within a porous cement. Any potency of such a compound must come from liberation of iodine.

I feel called on to show the influence upon a pellet of zinc oxid cement containing iodid of copper when it is placed in a sulphid staining solution, ammonium sulphid, for instance. The discoloration and disintegration seen in a short time would indicate that this simple test, and even the test of submitting a pellet to water, had not been made, and when we observe the comparative inhibitive power of this and some other cements when placed upon inoculated agar, it is hard to understand that the advertised bacteriological tests were ever intelligently made.

There is serious need of a light colored cement for pulp capping in anterior teeth, and for pulp canal filling. I took occasion to say recently before this society that I did not consider that the ideal root filling had yet been suggested, and that oxychlorid of zinc offered advantage over such a material as gutta percha in which there is apt to be porosity when used as it is ordinarily used for root fillings.

Iodin compounds lend themselves to advantage in root canal work. I have for a considerable time experimented with, and been in touch with, experiments with mercurous iodid as an ingredient of embalming paste and root fillings, and I take pleasure in inhibitory power of this compound when made an ingredient of an embalming paste or of the powder for oxyphosphate or oxychlorid cements. The most pronounced inhibitory results I have yet seen have come from small percentages of mercurous iodid and mercurous oxid.

This mercurous salt is used in medicine in minimum dosage of one-fifth grain. Its use for certain specific purposes is only contraindicated in internal medicine when potassium iodid is also administered, as a solution of this salt will dissolve the mercurous salt after which it may be transformed to mercuric iodid which is a more potent material and somewhat of a caustic, if in sufficient quantity.

Since the amount of mercurous iodid necessary in a mass of

oxyphosphate or oxychlorid of zinc sufficient for capping a pulp or filling a root would seldom exceed one-fiftieth of a grain, and since the presence of its main solvent, iodid of potassium, can not be conceived, or if present could not liberate sufficient mercuric iodid to be an irritant, there is no theoretical argument against its employment and practically, i. e. clinically, it has made a record of a great many comfortable teeth which might easily have been a discomfort.

We have much clinical evidence of the efficacy of some copper salts, but cuprous iodid has never been given mention in the pharmacopoeia. Even its white color does not give promise of creating for it a permanent place as a cement ingredient. Its use in so-called "white copper cement" will, however, undoubtedly be the means of the virtues of some other copper compounds being better understood and appreciated.

THE INDIRECT METHOD AS IT APPLIES TO THE CAST GOLD INLAY: A TECHNIQUE RECOGNIZING THE SPRINKAGE OF WAX AND GOLD.*

BY DR. L. C. BURGARD, LOUISVILLE, KY.

It is not my intention to prove within the scope of this paper, that more accurate results can be obtained by the indirect method, for we have long ago been convinced that in questions of this kind it is a matter of personal equation after all. But, we do wish to state most emphatically, that where different methods are presented to obtain a given result, it is well to carefully study the possibilities of these methods, and to choose that which temperamentally appeals to you.

The indirect method defined means where a model or die is made from an impression of a cavity, and from this the wax pattern is formed, the same as you do by the direct method. I admit the fact that an operation performed away from the original the possibility for perfection is lessened *per se*, unless it offers certain advantages that offset the disadvantages. In this particular work,

*Read before the St. Louis Dental Society, April 7, 1914.

to my mind, the preponderance of evidence is in favor of the indirect. For, to work on a model outside of the mouth, with complete access to every margin and line, where any discrepancy in reference to the relation of the wax pattern to its margin is perfectly visible to the eye, where possibilities of anatomical carving of cusps, sulci and marginal ridges are greatly increased, and this while you are seated comfortably in your own chair, can readily be appreciated by the uninitiated when we know that by the direct you are working in the confined space of the oral cavity, where the variation of lights and shadows must constantly be met with or solved by the sense of touch, hence the possibility of the wax not being forced to all the margins especially at the cervix, where in the event of failure the entire operation must be repeated in the mouth, and an explanation must be made to the patient, which saying the least does not impress him with your skill, and all this in a stooped position, and a surgeon's mental concentration leaving out the consideration of the patient's comfort and time, only presents a few of the enormous advantages the indirect has over the direct.

In view of this, we are at the same time cognizant of the fact that all this falls flat unless a model can be produced that duplicates the original within a range of working accuracy. This can be most readily proven, for an inlay made to accurately fit a model will have such a perfect marginal relation to the original cavity that the discrepancies are not visible to the naked eye, and that pernicious cement line is never visible in such construction.

IMPRESSION TECHNIQUE.

All cavities to make inlay work a success must be outlined according to the teachings of Black's Operative Dentistry. You all know the importance of restoring the normal interproximal space, which is invariably lost to a greater or lesser extent, depending on conditions and extensiveness of the decay. Allow me to present you a simple and painless method of getting separation, for at this time the use of mechanical separators, rubbers, and even cotton ought to be past history.

In simple cases this is gained by tying off as you may term it the contact with orthodontia grass ligature. This is accomplished by a piece of proper length and forming a loop by doubling it, and

through this pass ordinary silk ligature in link style. The piece of waxed ligature is passed between the teeth past the contact and then drawn through, which brings along the grass line. With this a knot is tied encircling the contact point tightly. On moisture it shrinks, and in that way opens up the space.

In cases of extensive loss of the proximal surface the cavities are filled with temporary cement, and a piece of sea-tangle tent pressed between before the cement hardens. On moisture this has the property of swelling considerably, and in this way opening the space.

The impression of the cavity is taken in modeling compound. In order to be able to get our material to where we want it and be able to remove it, we are forced as in other impressions to have some kind of a tray for this purpose.

I will briefly enumerate the trays used by some well known operators. Dr. Price has special trays made with which you are no doubt familiar. These trays come in different sizes and are "L" shaped with no sides except at the corners.

Dr. Van Woert uses trays made at the chair, as the special location or class of cavity may denote. For his material he uses platinoid 32. 34, 36, B. & S. wire gauge. The one end of these trays is left long enough to act as a handle, and the sides of the part to go around the part to be modelled are brought over slightly.

The writer used the method of Dr. Van Woert very diligently for some time but will be frank in saying that in many cases had a great deal of trouble in getting a sharp impression. This was especially true of a class of cavities that are abnormally deep from occlusal to cervical line and the interproximal space rather narrow. One main cause of the trouble was that as the tray was pushed down the surplus of the modeling compound would be wiped away so that by the time it reached the bottom of the cavity we did not have any left to get a sharp impression at the cervical.

The special technique employed by me which has given me accurate results in all classes of cavities is by the use of a loose fitting band. This is so adjusted that the band at no place hugs the margins of the cavity, this is absolutely necessary since we want the impression material to slightly creep around between this margin and band and get an accurate imprint of the cavity lines. This band

is so trimmed out on the opposite side of the cavity, segment like, so that when the band is down it only passes to the contact point on that portion of the tooth.

For convenience and also a time saver a series of three or four sizes and widths for molars and same amount for bicuspid can be kept on hand since they can be used over. Should however a case present itself where you wish to have a special band this can be readily made by cutting the band the way you want it, and in order to have the ends hold together without soldering, this can be accomplished by slitting the sides of the band at the end, on opposite sides, and then linking these two ends together.

After having adjusted the band as above mentioned modelling compound, (of which we find that put out by the Detroit Dental Mfg. Co., known as the "Kerr," as giving the best and nicest results), is used. A piece of this about twice the size of a cone of inlay wax, is warmed and cone shaped, and the point of a very plastic consistency, this is then forced down into and over the cavity, chilled and removed. Usually this gives us an accurate impression. If for any reason it is not sharp enough, if this impression is dried from all moisture, and a thin veneer like of the same impression material is spread over it, and rapidly passed back to the cavity and pushed home, it will give a most perfectly outlined impression.

We now come to the question how to obtain a record of the antagonizing tooth or teeth, and the width of the proximal contact. Some take impressions and bites and in that way get an articulated model. This we consider on the whole rather a too indirect method and one that has many shortcomings. A method of this kind calls for a great many accurate details and where a person has no laboratory man takes up a great deal of time and in this way would preclude it as a method desirable in the majority of offices.

After we have obtained the impression we proceed to place properly warmed inlay wax into the cavity as by the direct method and the patient instructed to bite. This gives us an accurate imprint of cusps and width of proximal space. With a suitable instrument this wax is trimmed so as to conform to the general contour of the tooth. No attempt is made to carve up any other portion such as the cusps, neither is any attention given as to marginal

adaptation in the proximal. All we want is the occlusal outline. This wax pattern is then laid aside with the impression.

CONSTRUCTION OF THE MODEL.

Our impression is carefully trimmed of all overhanging surplus and then pushed down into some freshly mixed plaster paris, in such a way that the cavity side is up, and the plaster forms a wall around it. After this has hardened it is trimmed down to within a $\frac{1}{32}$ of an inch of the impression.

For our model amalgam is used. While other materials are mentioned by a few, alloy gives us the greatest range. Any good alloy can be used altho in our practice we use copper amalgam since it can be utilized over and over. There is one thing that must not be done, and that is mixing it to that consistency used in filling. If you do your model will be absolutely worthless since no accurate outline is recorded. The amalgam must be mixed to a kind of "squashy" thickness. This amalgam is then packed into the above invested impression with a ball of cotton in a pair of pliers. This must be done carefully, so that it is forced into every little crevice. After the impression is so covered all over like a veneer, the alloy is then rid of all surplus mercury as you would for filling, and balance of the packing done with pluggers. Allowing from twelve to twenty-four hours for hardening, depending on the alloy used, it is then removed, which gives us the accurate model.

We now take the inlay wax pattern and place it back on said model as it was on the tooth, the model first being coated some light oil. We now carefully carve and where the margins are not perfect wax is melted and carefully pressed down so as to force it against the margins as it hardens. Here again a question comes up that can be readily solved by the indirect method.

In those cases where a cavity is deep occluso-cervically, there are two details in shrinkage that must be taken into consideration. In other words no person has yet devised a method where or how an inlay can be cast that does not show a shrinkage of from three to ten per cent. Or in other words it is impossible to cast a perfect inlay, one that would show a marginal adaptation as the malleted gold filling. In view of this allow me to present to you a few proven and established scientific facts.

Elasticity of Inlay Waxes:—Take a bar of inlay wax, warm to a working temperature, and bend it like a hoop, then chill. Now allow this wax to regain the temperature of the room, your ends that touched will open up, or it has a tendency to straighten. Take another piece and bend one-half inch from straight, when this regains normal temperature it often straightens back one-half. Further:—Take two bars of inlay wax, stretch the one and compress the other and chill. Cut both to exactly the same lengths, say four inches. Allow this to remain in the office over night where it is warm, the stretched one will shorten $\frac{1}{4}$ of an inch and the compressed one $\frac{3}{16}$ inch.

Contraction caused by difference from temperature:—One of the axiomatic laws of physics is that heat expands and cold contracts. In order to conform your inlay to the cavity it must be warm and plastic, in order to remove without distortion it must be chilled, and here we will record a shrinkage depending on the waxes of from one to three per cent. When we get ready to cast our gold let us for argument's sake say that the mold is an exact duplicate of our wax pattern. To cast our gold it is in a fusible state, and in this state it fills your mold, when it crystalizes we again record a fixed shrinkage of 2.2 per cent, using pure gold.

SUMMARY: First by bending, stretching or compressing our wax to get it adapted to the cavity we have errors due to the elasticity of the wax. Second:—Our wax from the working temperature to where it can be removed from cavity shows a shrinkage. Third:—The gold after casting shows another shrinkage.

Following the Taggart method we do nothing to counteract this shrinkage or neutralize it, in view of this I leave to you when I make the statement, no man can cast a perfect fitting inlay, whether there is a foundation to the statement, or do you now wonder why certain inlays fit so much better than others? But by the use of proper inlay waxes properly manipulated, and using the indirect method this can be greatly avoided. How?

First:—Distortion from elasticity of the waxes can be minimized to an imperceptible degree, by using a non-plastic inlay wax. By this we mean a wax that at ordinary temperature of the mouth becomes sufficiently hard so as to be removed without chilling to a sub-normal degree. Distortion due to elasticity is always due to

the wax being allowed to regain a temperature that is warmer. Evidently the sudden chilling of wax causes a molecular arrangement which when this wax becomes warmer gives it a tendency to return to the state or form it was when melted.

Second:—Shrinking of the wax can be minimized very much by the indirect method. After our wax pattern is shaped as we want it and cooled to normal temperature (by normal is meant room temperature) it is self-evident that it has shrunk all possible. Now if we follow a little technique which has given exceptional results we can neutralize this shrinkage at the cervical margin, and other margins if the inlay is extensive, by trimming away with a sharp instrument, a small "V" shaped wax along the cervical margins. In this press some plastic wax, and seal the margins exposed by this trimming. In this way all the shrinkage of the wax we have to contend with is just this very small marginal wax, since all the rest has "had its day." This we always do even in ordinary size inlays at the cervical, for there most of the shrinkage is recorded, and we will later explain. Since we have still to contend with the shrinkage of the gold we will have a method thoroughly practical which will neutralize it to some extent.

Third:—Gold shrinkage. Since in the majority of cavities the longest distance is from the occlusal to cervical margin, the total shrinkage of this part of the inlay shows up at the cervical. Since an inlay can not be cast that is absolutely smooth and as perfect in all its peculiar microscopic irregularities as the wax pattern was, our relation will necessarily not be as perfect. The result is that the inlay does not seat itself down into the occlusal part the same as the wax, and of course this would keep the part in the proximal from reaching the cervical even if the gold did not shrink. Therefore in large restorations we find a very bad fitting inlay at the cervical. In view of this we may take a piece of pure gold rolled out to three one-thousands of an inch micrometer measurement, and burnish this into the mold in the cervical portion, like a matrix for porcelain inlays, and allow it to extend up say a fourth of the proximal. Our wax pattern is finished on this as before, and before investing a piece of "V" shaped wax at the cervical is cut out.

After the inlay is cast it is placed back on the model, this gold carefully reburnished, removed and a few pieces of solder flowed into the space until flush with the margin.

In this way shrinkage is obliterated for the margins to the naked eye are as perfect as a malleted filling as I will show you in the clinic to follow.

Having finished or cast our inlay, immaterial what method you may pursue, all margins are perfectly finished on the model. With the inlay in the model we can spin the gold with a stone so held as to force the gold towards the margins. After reaching the margins the gold is then finished by burnishing it. If these details are carried out your inlay will fit the original cavity in the patient's mouth so accurately that in the majority of cases all you have to do is mix your cement and seat the inlay.

The details herein mentioned may appear to many as time consumers and hair-splitting theories, on, to him, abstract questions. To him I will say that if you will only make ten inlays for different types of cavities on models outside of the mouth you will find out that you are hypothecating your conscience, in persisting to pursue methods fraught with inaccuracies. As to being a time consumer, I can conservatively say, that to men equally skilled the indirect will take half the time of the direct, and to a person with a laboratory man there is no comparison.

In conclusion allow me to quote to you from a paper of Dr. Crenshaw in which he gives special warning as to failure at the cervical in all inlay work and how accurately this must be done to give permanent results. "In October, 1881, Marshall H. Webb made for Dr. W. G. Brown of Atlanta, in demonstration of his propaganda, an operation on an upper first molar with cohesive gold and electric mallet. The cavity preparation was even at that date in accordance with our modern extension for prevention. Fifteen years elapsed when it was discovered that the cervical margin was giving away and decay had set in and was progressing destructively. This instance is most convincing because the work had been done by the finest skill the world then knew."

PROCEEDINGS OF SOCIETIES.

ILLINOIS STATE DENTAL SOCIETY 50TH ANNIVERSARY HELD AT CHICAGO, MARCH 23-26, 1914.

DISCUSSION OF THE PAPERS ON OPERATIVE DENTISTRY BY DRS. E. T. DARBY AND E. C. KIRK.

[These papers appeared in the May number of the DENTAL REVIEW.]

DR. H. E. FRIESELL, Pittsburgh, Pa.:

It is a pleasure as well as a privilege to be here this evening and to participate in the celebration of the Golden Jubilee of the greatest dental society in the world. Not only is it the greatest in point of numbers, but in the regular and systematic development it has enjoyed since its inception; in the many lines of dentistry in which it has carried the banner for other states to follow; in the liberality with which it has given of its riches to all who asked; and last, but more important, it is pre-eminent in the large number of great dentists who have enjoyed its membership, many of whom, thank God, are alive and with us.

Coming from a state that for many years was conceded to lead in the field of dentistry, I have neither hesitation nor regret in acknowledging the superior position now enjoyed by Illinois. We in Pennsylvania have worked hard and done well and we feel that we have a dental history of which we may be justly proud; but we have only appreciation and applause for our sister state of Illinois, which has been fortunate in even greater accomplishments.

I am sure that the essayists and my fellow discussors will agree with me when I declare to you that the greatest pleasure we could ask for would be the assurance that we might have an opportunity to participate in the Centennial celebration of your society.

In the selection of your orator on this occasion you have rendered both honor and pleasure to the dentists of Pennsylvania, for I assure you there is no better beloved man in the profession of the East than Professor Edwin T. Darby.

The essayist is one of those talented natures who can touch no subject but to adorn it, and the present instance is an excellent example of his style. in that he leaves us little to discuss and less to

disagree with. As we listened to the description of the earlier days we were treated to a mental moving picture of the dentistry of the past. It required little stretch of the imagination to conjure up the personal appearance and environment of Revere, Lemaire, the Greenwoods (with Washington's teeth that we have all seen), Josiah Flagg, with his high top boots, and ruffled shirt, with the rosewood box of pearl handled instruments, and the ever present human skull for demonstration purposes. We might even recall with some profit his famous prescription issued in 1800 for the treatment of receded and bleeding gums; namely:

"Use cold water, and a brush, every day after rubbing the gums hard with your finger to make them bleed what you can. Rinse them clean with cold water, holding the water in your mouth until the keenness of the air is off before you apply it to your teeth: After which use with the brush the warranted and approved antiscorbutic tincture—but do not rinse it off for some time. It may be used every day for the first week or ten days, and once or twice a week afterwards, at discretion:—When once in good order there is no further need for a Dentist or Medicine. Fear not the stiffness of the brush; and if your tincture is too potent for the gums, add to it Port Wine to your liking."

Nor is it difficult to picture the old time dentist without rubber dam, dental engine, cement, amalgam or gutta percha, "tapping" a putrescent pulp, wiring loose teeth together, filling cavities with non-cohesive gold or ton foil; replanting and transplanting teeth; extracting with the turnkey; and between whiles carving a set of teeth out of hippotamus ivory, or refining and rolling his own gold plate, and making his own instruments; no compressed air or gas but the old mouth blow pipe and the large wick alcohol torch; or perhaps a homemade foot bellows composed solely of wood and rawhide.

When we think of what these men accomplished with their lack of appliances, materials and knowledge, what must be expected of the dentists of the future with modern appliances of the best, perfected materials and definite scientific knowledge of which the pioneer dentists never dreamed:

Inasmuch as a discussion cannot very well be a discussion without differing somewhat with the writer of the paper I will try

to touch lightly on a few points which the essayists kindly put in italics in order that the discussers might have a chance to say something on their own account. In regard to the use of gold foil for filling teeth prior to 1800, the printed records would indicate that Josiah Flagg did so as early as 1782 to 1785.

Paul Revere was an expert worker in precious metals and had made an appliance by which an artificial tooth had been bridged to a natural one for General Warren, and it was by this appliance that Warren's body was identified months after his death at the battle of Bunker Hill. While I do not know of any definite record of foil filling by Revere, we know that it was common in France at that period and there is no reason to suppose it was not practiced by the earliest of American dentists. It was also my impression that Robert Arthur discovered the cohesive property of gold and made it known to the profession.

The papers by Dr. Perry in '77 and Dr. Webb in '81 may have had some influence in overcoming the fallacy of permanent separation of the teeth, but I fail to see wherein either one gives evidence of any conception of what we now understand by the phrase "extension for prevention." In the first place the exciting cause of caries was not known at that time; and little attention was paid to its points of beginning, manner of progress, and the limitations of its surface extension, either at that time or since then, in certain sections of our country. Several articles emanating from the sections referred to in the past pentade evince a conception of the theory of extension for prevention that is certainly weird, and affords much amusement to those who practice the method.

It is remarkable how sectional prejudice can influence methods of practice even to this day in dentistry. If the Illinois State Society never did anything remarkable besides producing the great teacher who gave us all that is included in the knowledge of the cause and management of dental caries, as epitomized in the phrase extension for prevention, it would merit the praise of mankind. Perhaps I should modify that sentence to read "The great teacher whose influence has had much to do with the making of the Illinois State Society."

Digressing a moment to speak of the gold inlay, I think one of the greatest points in its favor is that it promises sufficient easing of the operative burden to induce many operators to so anesthetize their sensitive consciences as to permit any amount of extensive cutting. I refer to operators who heretofore, through the supposed pressure of conscience, were unwilling to cut away so much *good, sound* tooth structure as they thought necessary in order to practice extension for prevention. The lessening of inconvenience to the patient (and incidentally to the operator) is evidently a stronger motive than the appreciation of pathological requirements for permanency of operations.

Undoubtedly the essayist is correct in extolling the wisdom of the operator which extends to the intelligent selection of his filling materials; but to the age, complexion and convenience of the patient I would add as modifying influences, a definite knowledge of tooth anatomy; of the histology of enamel, especially as to the direction of the enamel rods and the presence of short rods at the cavo-surface angle; of the morbid anatomy of caries; and of the health and age of the patient in their influence on periods of natural immunity to the disease.

It has always been a mystery to me *why* those followers of Webb who acknowledge the necessity for the extension of posterior proximal cavity walls well into the buccal embrasure, in order to avoid recurrence of decay, seem to consider that pathology is superseded by esthetics in the anterior teeth, and that the extension of the labial wall of anterior proximal cavities well into the labial embrasure is malpractice.

This seems to be a plain case of the wish being father to the belief. We all deplore the unnecessary display of gold, but isn't it better to make at the primary operation the amount of exposure that experience with dental caries has taught us will ultimately be required, than to arrive at the same result after two or three re-fillings of the improperly extended cavity? Permanency of protection to the tooth surface involved, it seems to me, is more important than a little esthetic hair splitting as to whether 2 or 3 millimetres of gold is to be seen. A well made gold filling in my estimation is vastly more pleasing in appearance than a porcelain inlay or silicate cement of poor color.

In the case of the child of ten, why not restore the lost dentin by oxyphosphate of zinc cement which will not discolor the tooth; (or perhaps the new non-discolorable copper cement), and replace the lost enamel by a good high grade, hard amalgam.

The essayist lays stress upon the statement that other and greater improvements in the formulas of amalgams will render that material increasingly popular. Surely he has inadvertently overlooked the manumetal work done by Dr. Black some 15 years ago in which he revolutionized our knowledge of the metallurgy and manipulation of amalgams, and produced a complete upheaval in the manufacture thereof, which resulted in the elimination from the market of scores of the old type alloys, and relegated the home made brand to the pages of dental history along with cataphoresis and the theory of the revitalization of decalcified dentin.

Amalgams made according to Black's teachings can now be obtained that are reasonably and practically perfect for dental purposes; and most of the criticisms directed at amalgam today are chargeable solely to improper manipulation of the material.

The placing of the amalgam question on a scientific basis both as to manufacture and manipulation is another jewel in the crown of the Illinois Society. There are so many jewels in that crown that it would require a good sized volume to enumerate them all, which would be entirely beyond the limits of this discussion, but since the paper of the evening is principally historical in character I trust it will be in keeping if I refer to only a few of the works of members of this society that establish milestones in the progress of Dentistry.

Forty-six years ago, a young man about 30, read a paper before this society on the care and manipulation of gold foil. The young man's name was Black and the work was so thoroughly done that no one has since added anything to the principles so beautifully presented.

In 1880 an exhaustive study on the histology of the periosteum and peridental membrane was presented and has had a like history. In the American System of Dentistry published 30 years ago there appeared an article on the Histology, Pathology and Treatment of the Dental Pulp and if there is any better work upon the subject at the present time, the speaker is not acquainted with it.

The Histology of Enamel in its application to the formation of cavity margins; the Pathology of Caries of the Enamel, and a work on Dental Anatomy, that is an ideal text book on the subject, are more jewels set by the same lapidary.

In 1888 the basis of an Operative Technic course was presented to this society and has since become an important part of the curriculum of practically every dental school in the country.

Within the ranks of this society originated the only system of dentistry that is broad enough in scope or thorough enough in detail to merit the name of system; and one which is taught in the majority of our dental schools today.

In the long list of meritorious efforts Black's works on the Physical Properties of Filling Materials; an investigation of so-called Hard and Soft Teeth; and his recent work on the Formation of Calculus and the Treatment of Pyorrhea take a prominent place.

Add to this list your eminent workers in Porcelain, Poundstone's studies in cements; Noyes' in Dental Histology, Goslee's in Crown and Bridge Work, Prothero's and others in Prosthetics; the remarkable group of Oral Surgeons that you number among your members, and last but by no means least Taggart's work on Cast Inlays and Buckley's teachings on the treatment of putrescent pulps.

I know that there is a tendency recently manifested in some quarters to question the value of the formo-cresol treatment, but the speaker's experience with it has been uniformly successful and when it was introduced into a college clinic where prior thereto the treatment of teeth had been the greatest bugbear in the school, and it gave a record of only one failure in the first two hundred cases treated, it seems to me that the method has much merit and that possibly some failures reported may be due to technique as much as to anything else.

Not only has your society been pre-eminent along the lines of scientific research; but in many others it has led the way. You are the best organized dental society in the world, and the plan you have worked out so successfully has been carried by your missionaries to many of your neighboring states, and to the National Dental Association, and bids fair to soon result in the organization of

the whole profession of America. Your work in the establishing of study clubs has been largely copied; and the various G. V. Black Clubs, of which the one in St. Paul is the oldest and greatest, all of them inspired to study and work by the splendid example of your greatest son, have done magnificent work in various sections of the country.

The splendid work you have done in the field of Oral Hygiene assisted by your Commissioner of Public Health, Dr. Evans; and your extensive campaign in Public Dental Education have done much to assist and stimulate the work in other states. The Dental Index Bureau, organized by some of your members, will do much to make available that literature that Dr. Darby specifies as essential to the dignity of a profession; and the proposed adoption by your State Board of Examiners of the plan of examining students at the end of the Junior year in the fundamental subjects of the curriculum, will leave teacher and student free to apply all their time to their study in the senior year of the subjects that properly belong to that year, and will greatly increase the efficiency of the college course.

One of the purposes of the study of history is that we may gain thereby knowledge with which to forecast the future. Dr. Darby has mentioned two epochs in dental history, to which I think we may add a third, at the threshold of which we now find ourselves. And in the light of what has been accomplished in the past may we not prophecy an even more brilliant future, a future wherein a better educated class of men will enter the profession through our schools, which having evolved from the necessary period of private development shall be taken under the support of our greater universities, recognized as worthy of their fostering care, and enabled to develop far beyond the point attainable by private enterprise, limited by business principles to self support.

In this new epoch we shall find the care of the teeth of the young considered of at least equal importance to their schooling and looked after in as systematic a manner by school or municipal dentists. Large employers of youthful labor will employ institutional dentists to care for their workers. In every public institution in which human beings are confined or supported, they will be

given as thorough dental care as they are now accorded medical attention.

The development of anesthesia and analgesia will render pain obsolete in dental operations; a better knowledge of physiology and dietetics will greatly modify the ravages of caries, erosion and diseases of the peridental membrane; and it is not too much to expect that someone will devise a cement sufficiently germicidal and non-porous in character, and indestructible under the stress of mastication to make the anchoring of a gold inlay, a permanent operation.

A non-porous silicate cement of sufficient edge strength to permit of contour work and the replacement of the bevel of enamel required by the physical conditions presented in the enamel margin will add much to the efficiency of the dentist of the future.

A recognition on the part of both dentist and physician of the intimate relationship between the health of the mouth and the health of the individual, and the intelligent co-operation of both professions in the care of the health of our people presents a perspective of the future of dentistry that should make anyone proud to be a dentist.

Since she has so ably led in the dentistry of the past, there is reason to predict that the Illinois Society will also be at the head of the vanguard of dentistry in the Third Epoch.

In the absence of Dr. W. T. Chambers, Denver, Colorado, on account of illness, the President called upon Dr. C. N. Johnson, Chicago, to continue the formal discussion.

DR. JOHNSON:

Mr. President, Ladies and Gentlemen: I want to express my keen regret at the circumstance which compels me to inflict myself upon you for a few moments. I am sure we are all sorry indeed that Dr. Chambers at the last moment was prevented from being with us. It is a pleasure, however, to be permitted to pay my tribute to the essayists of the evening, and also to the gentleman who has opened the discussion. Dr. Friesell mentioned the fact that he believed the essayists and those who were to open the discussion would esteem it a great privilege if they were permitted to attend the centennial of this society, and I want to announce that is precisely what I expect to do. (Laughter.) You could not hold

a meeting of this society without me being present, because ever since I have been a member I have not missed a single meeting, and I am a life member. It is to this society I owe more than to any other one organization for everything I know of dentistry. (Applause.)

I have been interested, Mr. President, in the recitation by Dr. Darby of the development of dentistry in the last fifty years, and I have been impressed with the remarks that have been made regarding the mistakes that have occurred in that fifty years. The names of eminent men have been mentioned here tonight, men who were the founders of dentistry in this country, and while those men have made mistakes, while false theories have been taught, I want to say that the profession has learned something by every failure that has been made. I believe we learn more from our failures than from our successes. If we could go along in practice and always be successful in our work, we would not advance. While the history of the profession is strewn with the wrecks and failures, I take off my hat to those men who have made the failures because they have gone ahead as pioneers in the development of the profession and have not been discouraged because they have fallen down at times. Heaven bless the man who has the enthusiasm, the magnificent initiative which makes him to try to put the various theories he has into practice in the mouths of his patients.

Dr. Kirk has said that the technic of the future must be based more upon correct etiology and pathology. That is true. The theory of separating teeth by filing while disastrous for a time, led us into a more efficient method of treating proximal cavities in teeth, and while for a few years much havoc was wrought, yet I honor the name of Arthur because he had the courage to come before the profession and advocate what he thoroughly believed in at that time.

I believe that we have come to the period in our profession when the axiom made by Dr. Kirk is absolutely essential to further progress and to the best interests of our patients, and that is, our students in college must be taught the fundamentals of etiology, the fundamentals of pathology and histology upon which the basis of all technical procedures must be built.

Now, Mr. President, there are others who are to discuss these papers tonight. I simply want to pay my tribute of respect to the essayists, to Dr. Darby, who has sacrificed much in coming here, to Dr. Kirk, who has given on the spur of the moment a most masterly statement.

I want to compliment Dr. Friesell on what he has told us, and I want to thank especially the old pioneers of the profession. I never hear the names of the men who have been mentioned tonight without feeling like taking off my hat. When I think of the environment of those men, the disadvantages, the handicaps under which they labored, although they did make mistakes, I marvel at the progress that they made. They established the foundation of dentistry, and it was the teaching of such men that gave the founders of the Illinois State Dental Society a basis upon which to build this magnificent organization.

I cannot take my seat without expressing my appreciation to those who have come here from distances to honor us on this occasion. We are proud of the record of the Illinois State Dental Society; we are prouder yet of the fact that on occasions of this kind we have rallying around us men outside of the state. I want to express as a member of the Illinois State Dental Society my appreciation of those who have come from such distances, and who today have given us an international dental clinic, one which I do not believe has ever been surpassed in the history of the profession. (Applause.)

While our worthy President and the officers are entitled to an immense amount of credit for the success of this meeting, I have felt all along that we would not have a successful meeting, no matter how much energy the Illinois members might throw into it, if we did not have the loyal support of the members of the profession from other states and from other countries. (Applause.)

PRESIDENT LOGAN:

Dr. Johnson has suggested that we have had friends in helping us to make this a great meeting. I will tell you where the attendance comes from. Every editor in the United States and Canada gave us not only an announcement of this meeting, but they gave us editorials, and the next man I shall call upon gave us to my

mind one of the most brilliant editorials with reference to this meeting. I will ask Dr. Ottolengui to discuss these papers.

DR. R. OTTOLENGUI, New York City:

Mr. President and Gentlemen: It seems to me, that most of the unexpected and unmerited honors that have come to me have come to me in this city and from this Association. I want to say in all truth, that nothing was further from my thought than that I would be permitted to say one word at this meeting, and in thanking you for the opportunity of going down in history as one of those who spoke on this occasion, I will pass on to the discussion of the subject of which I have a little to say, but that little I believe is of the utmost importance.

We have been led along by the orators tonight from fifty years ago and earlier, down to the present time, and the most important fact that has been brought out has been the evolution from the days of the flat fillings to the period of constructing contour fillings. But it seems a marvelous thing to me, as we look back, that this word "contour" should have been restricted to the circumferential forms of teeth. It seems remarkable that all of our skill and science in the past should have been aimed at the restoration of the proximal surfaces of the teeth, and that so little should have been devoted to the restoration of the masticatory functions of the teeth. It seems to me either that we must extend the word "contour" to mean every surface of the tooth, or else, and I think perhaps this is better, we must now begin to consider the word "restoration." In this connection I might relate an incident in my own practice which makes me favor the use of the word. A patient, who had been educated up to the difference of masticating her food with flat fillings by having her teeth "restored" to masticatory form, has become so enthusiastic upon the subject that she examines the teeth of her friends with a mirror, and when she finds a person who is proud of the inlays which her dentist has done, claiming that she has had her teeth filled in the most up-to-date manner, she says to them, "Yes, you have inlays, but you have no restorations." (Laughter.)

Now, gentlemen, it seems to me, that we are just at the dawn of a tremendous revolution in dentistry. It has been said that

the axiom that the teeth must be "contoured," made one revolution, and that is true; and I say now, that the axiom that the teeth must be "restored" must mark another revolution. We are beginning to listen to the reports of men like Grieves, Hartzell and others, who tell us that the initiation of disease far distant from the oral cavity may have its inception in the oral cavity, not only through diseased conditions about the teeth, but from improper mastication of food, which puts a super-burden upon the digestive organs, thus weakening the vital resistance of the entire body to the virulence of bacterial infection when it arrives. During the cholera epidemic some years ago a man declared and proved that he could drink water infected with cholera germs, because it was possible with his perfect digestion to destroy them in the intestinal tract. But that cannot be true when digestion is enervated because organs are obliged to do work which should have been done in the mouth. So I say to you, one of the most important revolutions which must occur in dentistry to-day must be a new technic which will restore masticatory forms of the mouth, and whatever gold foil has done in the past it has absolutely failed to do that. I have seen the work of the best men in dentistry that has stood for thirty and forty years, and I have seen some of the work of the pioneers and none of them has restored the masticating surfaces of the teeth as they can be restored by that wonderful process of inlaying which has been given to us by Taggart. (Applause.) I want to say, regardless of all the appreciation I have for the work that has been done by all the other scientists in this state, no one man has given more to dentistry in the possibilities of carrying out of the basic principles of tooth restoration and tooth preservation, for which Black and others laid the foundation, than this man Taggart, and any monument you build to the men in this state, if it does not have Taggart's name written on it along with the others, will be a false monument. (Applause.)

The other revolution which I think must occur and for which I appeal to this society for help, must originate in an appreciation of the fact that much of the disease of the body is due to root-end disease, and that is due largely to incompetency in the dental profession, in failing to master this most difficult operation. I want to say, and I say it unhesitatingly, that not five per cent. of all

root canals that have been filled in the whole history of dentistry have been correctly filled; that not ten per cent. of all the men who are capable of correctly filling root canals have always done it in the past, and this can only be discovered by the man himself when he begins to check up every root-operation with radiography. Then he will learn that even though he may have reached the terminal apex of the root canal, somewhere in his technic, sometimes he may have made a failure. That is a very serious proposition, because it has been said it is impossible to have patients pay for this work. Gentlemen, I tell you it is not impossible to have patients pay for anything that you offer to them, if they realize that it is worth the price which you ask. It is entirely up to ourselves to educate patients to the understanding that the crown of a tooth, never mind how well decorated with porcelain or with a gold inlay, is valueless if it has a cheap incompetent root canal filling in it, and I suggest to you gentlemen, to the wonderful executive men in this society, that you begin at once upon this propaganda, this revolution in root canal work in this country, which can only be done in one way, and that is, this; you must have competent men as instructors; you must have study classes, and take twenty-five men at a time, and teach them how to teach others to do it, and thus let the doctrine spread and the degradation of dentistry pass. We have been inviting the co-operation of the medical profession, and now they are finding that much of disease which they have been incompetent to cure, is largely brought about by the incompetency of the dental profession. (Applause.)

PRESIDENT LOGAN :

We have had a formal discussion of this subject until now. Hereafter we will have a general discussion on operative dentistry and each speaker will be limited to five minutes. I will call upon Dr. Callahan, of Cincinnati.

DR. JOHN R. CALLAHAN, Cincinnati, Ohio :

I do not know what I am to say. I have been called upon unexpectedly, without any preparation, and when I look into the faces of this large and intelligent audience I lose what thoughts I may have. I can only agree with what the last speaker has said because that is uppermost in my mind, that it is up to the dental

profession to prevent infection in the neighborhood of the root ends. I have been working to that end for a number of years, and I do not claim any great success. I have been doing the best that was in me. The work of Dr. Hartzell and others is to be particularly commended and noted, but above all things that should be taken notice of, is that the medical profession are taking a note of conditions and calling us to time, and we deserve it. We have neglected this work, as has been said, and I hope from this Illinois State Dental Society we will receive further aid in this direction. I feel it would be unwise for me to take more of your time. I thank you. (Applause.)

THE PRESIDENT:

Dr. Rhein, of New York, has been called for.

DR. M. L. RHEIN, New York City:

Mr. President: Someone has said that you can do only one thing well at a time, and for twenty years or more there has been in my mind only one feature in operative dentistry that has been uppermost, and it has been the subject that Dr. Ottolengui has alluded to. I have given the best that has been in me, and I believe, as he has so well said, that the one great problem that presents itself to the profession today is the solution of this question whether it is feasible for us as a profession to leave teeth with devitalized pulps in such a condition that they are free from infection, or whether it will become necessary for us to resort to the means that they have practically adopted in England, and that is, the ruthless extraction of this class of teeth. I believe the problem is a solvable one, and if it is solved it will be the readiest means of bringing American dentistry back to the place where it preeminently belongs. (Applause.)

DR. DONALD M. GALLIE, Chicago:

Mr. President, Ladies and Gentlemen: I must confess before attempting to discuss the papers that have been presented this evening, that on account of numerous duties I was unable to listen to all of the splendid message which Dr. Darby and Dr. Kirk have brought to us from the East. I do know that those who heard them declare that they were among the best ever presented on the subject. This message of theirs will stimulate the men of the far

and middle west as well as their associates of the East to greater efforts in combating the ravages of the commonest of all diseases, caries of the teeth. Our friends may differ a little with us in the matter of extension in this or that direction, yet we are all aiming to do the same good work to preserve the dental organs. I regret my inability to discuss intelligently these splendid papers, but am pleased to have the opportunity of saying a word of praise and extending my thanks to these gentlemen for coming to address us this evening. (Applause.)

THE PRESIDENT:

Dr. Patterson of Kansa City is called for.

DR. J. D. PATTERSON, Kansas City, Missouri:

Mr. President: You know very well I cannot talk without preparation. All my friends know that perfectly well. I am very glad, however, to be here, and I am very glad to be called upon in order that I may say to Dr. Darby, to Dr. Kirk, to Dr. Johnson and others who have spoken, how much we have appreciated and I have appreciated all they have said, not that I agree with all of them in what they have said, not by a good deal. (Laughter.) But I should like very much to have had an opportunity to prepare myself to speak upon the points in which I do not agree with them. There are one or two, and I will name them. First, in regard to the conditions which bring about caries of the teeth. Too much attention has been given by Dr. Kirk especially, to environment and none at all in regard to the hereditary character of the tissues and the teeth. All the credit has been given for the destruction in both to environment and none to congenital conditions or heredity. I object to that.

I also object, strenuously, and I should like to have had an opportunity to prepare myself and to tell you why I object to some of the things said about amalgams.

As I told you before I cannot speak without preparation and make myself clearly and sufficiently understood. I nevertheless thank you very kindly for the opportunity of being invited to speak.

THE PRESIDENT:

Before calling upon the essayist of the evening to close the

discussion, I wish to introduce to you the President of the National Dental Association, Dr. Homer C. Brown, Columbus, Ohio.

DR. BROWN:

Mr. President, Ladies and Gentlemen: I assure you it is a great and distinct privilege to me to meet with you on this your fiftieth anniversary and to observe the enthusiasm which the gentlemen from the East and those who have discussed these papers have brought to you, for it has indeed been an inspiration. I shall not attempt at this time to discuss the subject of the evening, but I wish to extend to you, Mr. President and your co-workers, the hearty congratulations of the National Dental Association on the success of this meeting. We all know that when Chicago and the Illinois State Dental Society start to have a big meeting, they make a success of it. I have attended your meetings heretofore and they have been very successful ones, and on this occasion I assure you you have surpassed your former records.

In speaking for the National Dental Association, I would have you understand that this is the first year of its reorganization, and I am confident that our membership will be from 14,000 to 15,000, which is quite different from what it has been in the past; and furthermore, I will say that the Illinois State Dental Society is the largest component body of this great national organization.

I suppose it is unnecessary for me to remind you that we are to hold our next meeting at Rochester, New York, July 7th to 10th, and as President, I extend to each and everyone present tonight as well as all reputable practitioners of dentistry and medicine, a cordial invitation to attend the Rochester meeting in July. (Applause.)

THE PRESIDENT:

Since the last speaker took the floor, the son of the man of whom we have heard so much said, and very appropriately said, this evening, has entered the room. Dr. Arthur D. Black has been asked to come to the platform. (Applause.)

DR. ARTHUR D. BLACK:

I will not detain you, Ladies and Gentlemen, to discuss the subject which is before you tonight. I am pleased to join with

the other Chicago and Illinois men in welcoming all of you here to Chicago. We hope you will have a good time. (Applause.)

DR. KIRK (closing the discussion):

Every time I come to Chicago, to attend a dental meeting particularly, it is like a home-coming. Not only in a professional sense, but I was born in this state, only one hundred and ten miles west of Chicago, and while I have had no particular influence in developing dental interests here, it is always a great pleasure to come back and to see how my own people have grown since I have left them. (Laughter and applause.)

DISCUSSION OF DR. THORNTON'S PAPER "CROWN & BRIDGE WORK."

DR. A. J. BUSH, Columbus, Ohio:

One of the great surprises to me is the energy, the dynamic force of your president. Dr. Logan is not a very large man, if judged by his physical proportions; but judged by his executive ability he is a giant. His influence has been felt from ocean to ocean; from the Gulf of Mexico all the way up to where the British lion guards with jealous eye the frontier of the British Possessions. Not satisfied with getting people from all parts of this Union, in spite of the fierce look and awful growl of the British Lion he kidnapped many Canadians and numerous representatives from various foreign countries. The name of Doctor Logan should be changed to Doctor Dynamo.

While it is true that we may be contented with the present day possibilities of modern crown and bridge work, I think it is equally true that we have a right to be discontented with its present day practice. I believe the most valuable lesson which can be taught regarding modern bridge work, therefore, will not be gained through a description of the great possibilities of present day methods or a recital of the innumerable methods which are available, but rather through a consideration of the impossibilities, if you please, and the failures which follow the disregard for the few requirements which govern its practice.

I am so thoroughly convinced that the greatest message that I can bring to you at this time is found in the consideration of the requirements alone, and so anxious am I to take advantage of this

great opportunity for driving this lesson home, that I propose to waive all other considerations, lest I might confuse my meaning.

There are five requirements which govern modern crown and bridge work, which, named according to their importance and in sequential order are as follows :

Physiological
Hygienic
Anatomical
Mechanical and
Esthetic.

While all these requirements are of great importance, and cannot be disregarded without inviting failures to some degree, still some of them are of greater importance than the others. The two most important are, without question; the physiological and the hygienic, and above all, these are the very requirements that are most commonly disregarded, if not entirely lost sight of, in the practice of modern crown and bridge work. So I wish especially to call attention to these two requirements in particular.

Of what avail is it to teach methods, when the very pre-requisites to success in applying these methods are ignored? Why should this age proudly boast of a multiplicity of methods when the great army of modern day practitioners exhibit the most flagrant disregard for the very essentials, the observance of which guard the portals to success? It is far better to be a master of one method only, and to practice that method in accordance to and in compliance with the requirements, than be a master of a thousand methods and to be ignorant of the requirements which govern their application.

Instead of practicing crown and bridge work and making its construction and application subservient to the requirements in the order named, we are continually confronted with the spectacle of an evidence that seems to be conclusive, that in the modern practice of crown and bridge work the order has been reversed wherein the esthetic requirement is treated as of first importance, the mechanical as of second importance, the anatomical as of third importance, the hygienic requirement ignored and the physiological requirement absolutely disregarded.

The prevailing tendency seems to be to practice crown and bridge work wrong end to, if you please, and apparently, only three

requirements are recognized in the ordinary plan of procedure. To repeat, the chief object seems to be to construct crowns and bridge work in such a manner as to have them first to look well, second to construct them so that mechanically they will hang together, and lastly, to give them such anatomical designs as will to some degree serve artificially to perform the functions of the missing teeth. No thought is given to the desirability of placing the abutment teeth or roots and also the contiguous tissues in a perfect state of health, or to the proper management of such details of adaptation and construction as are of vital importance to the living tissues, and which will, to the least degree, interfere with the maintenance of their normality.

Since the stability of bridge work is equal to, and in direct proportion to, the stability of the teeth which serve as abutments, and since the functional value of bridge work is no greater than the functional value of the teeth or roots supporting it, and since it is through the physiological requirement that these features are chiefly considered, it is not easy to comprehend how this requirement can be so lightly thrust aside, unless it is for the reason, that the consequences of this neglect are more or less remote from the time the offense is committed, while the esthetic and the mechanical are more immediate.

I am inclined to give the physiological requirement a broader interpretation than is generally accorded to it. While the fullest recognition of its fundamental importance can only be revealed through a complete comprehension of the physiology of the living tissues concerned—and while the dual life of the teeth themselves, the three-fold functions of the periodontal membrane, the provisional and transitory nature of the alveolar process are sufficiently well understood to render the application of crown and bridge work to these living tissues feasible—yet I am convinced that a great lesson will have been learned and a still greater benefit to humanity will have been rendered when it is more thoroughly understood that the mechanical and anatomical requirements which govern their adaptation and construction are absolutely amenable and subservient to the physiology of the living tissues to which they are attached.

To quote from a former paper: The popular estimation of bridge work seems to be inseparably associated with the ideas of

mechanics alone. Yet, its conception and successful application depends entirely upon a practical knowledge of anatomy and physiology, and the closely allied sciences of pathology and therapeutics, and it seems quite certain that the employment of bridge work in general would meet with more universal success if those who perform these operations would more exhaustively familiarize themselves with the anatomy, histology, physiology and pathology of the living tissues and structures involved, and accordingly make bridge work subservient to them, and therefore, regard the employment of mechanics, only as an incidental but necessary procedure in their construction.

If success in modern crown and bridge work can be achieved only through compliance with these five requirements, then it must also be true that failure to comply with any one or all will invite ultimate failure. What nobler ambition could we manifest at this Golden Anniversary meeting, which marks the close of a brilliant half century of success of the Illinois State Dental Society, than to look back in retrospect over our failures in the firm belief that mistakes are sometimes more illuminating than our successes?

While we have a just right to feel proud of the many achievements of the past half century in which Illinois has played no small part, I think that in the interest of humanity we can most profitably pause for a while to consider the cause of the failures in the practice of modern crown and bridge work, in an effort more firmly to establish the foundations on which we have striven to build.

Since this is the phase of modern crown and bridge work that I have chosen to present, I have taken the liberty, therefore, to bring some evidences of failures in order that I may drive home more graphically the truth that I am contending for, and in the hope that thus I may bring to your attention more strikingly, what I had in mind when I began with the statement, that, while I think it is true that we may be contented with the present day possibilities of modern crown and bridge work, I think it is equally true that we have a right to be discontented with its present day practice.

These evidences of failures, which I will now present to you in the form of a silent clinic, will only take a moment of your time, and will need no explanation.

Dr. Bush showed upon the screen some skiagraphs of badly constructed crowns and bridges.

DR. HERMAN E. S. CHAYES:

Mr. President, Dr. Thornton, Members of the Illinois State Dental Society, Ladies and Gentlemen:

I am deeply grateful to those of you who are responsible for my presence here tonight, and I am deeply conscious of the responsibility which comes to me with this invitation to discuss this paper—but, may I be allowed to let the paper rest until I have unburdened myself of the thought at present uppermost in my mind?

There is sorrow in my heart at this moment. I envy you. Not because of this great success of your 50th anniversary, to which success I have come a thousand miles to contribute, but I sadden at the recognition of the appalling fact that we of the East could not duplicate it, let alone surpass it. I come from the Empire State, a state geographically favored, financially fostered, scientifically alert and mechanically well balanced. I come from a state where heroic things are the rule, where gigantic enterprises are daily occurrences; where the house-high waves of the mighty oceans beat a perpetual tattoo upon the rock-bed of my city, and yet leave it unhurt. And yet, here tonight, you have made me feel its inefficiency—its lack of solidarity—its disintegrating factionism. We of the East, we of the proud Empire State, we could never duplicate this meeting; I don't know exactly why this is so, we have the men and we have the leaders; perhaps it is because, Irish-like, every man wants to be a leader, and so we breed dissension, which destroys the possibility of harmonious action.

I doubt much if any other state in this Union could have equalled the result you show, and surely this must be a proud moment for all of you, the thousands of you here, eager to see and hear—eager to learn and to teach, to watch and to show all things which will improve you, which will help you to better practice a profession, the practice of which should consecrate you to the service of humanity more than any other profession in the world, including ministry. And so, before I take up the discussion of the paper of the evening, I want to wish you well at this—a most inspiring moment of your career, and I wish you God speed with a conscious-

ness that you will march onward and forward upon the road of progress, always watchful to keep the escutcheon of your Society unsullied and yourselves worthy of your consecrated task.

When I say that the practice of dentistry should consecrate you to the service of humanity, I am merely stating a truth which sooner or later will be recognized by everyone.

There is no other profession which calls for so thorough an understanding of the interplay of the mechanical and biological as dentistry, so interdependant are the two phases mentioned, that no distinct line of demarcation is discernible.

We see the apparently purely mechanical placed into an environment of livingness, it is made to interplay with living tissues, which function and which make its function, and behold consequences of a biological nature are the results. That is as it should be, but that it is not always so has been very efficiently demonstrated, or rather illustrated by both the essayist and the second gentleman who discussed the paper.

Dr. Thornton is correct in condemning all the filthy, inefficient uncalled-for monstrosities usually masquerading under the name of "bridgework." He is correct in his exception to the so-called "open-faced crown" (is there really anyone living who still uses this abomination?) and this part of his paper would tend to show that with all our meetings, all our schools, all our clinics, there is still something desperately wrong with the great number practicing this profession.

It must be that the majority of the men do not understand the vital principles involved in this particular branch of our work. They do not seem to grasp the fact that a piece of bridgework executed on wrong physical principles, becomes a menace to every biological function the body is capable of. It becomes an ever active source of pathological proliferation, infested with filth and fermentation, which no bactericidal or phagocytic action of the blood, present in that environment, seems able to overcome.

I have written much and spoken more upon this subject and the storm of bitter comment as well as favorable notices an article on "Empiricism of Bridgework" (Items of Interest, 1910) evoked, gave hint of existing conditions which called for the radical and thorough attention of every man practicing this profession honestly

and with a true desire to serve mankind. I said then that our text-books are largely to blame for this chaotic state of affairs and the pictures thrown upon the screen by Dr. Thornton prove this to be true. A quotation from the article mentioned will be timely and illuminating.

"The methods for conveying the scientific, the accurate, the absolute in dentistry; the methods of teaching this character of work are wrong because they are constructed upon false foundations, and no amount of trimming will bring them into plumb.

I have but to quote some of the paragraphs from various text-books to convince anyone that, while one of the authors elaborates upon the method of construction of a certain piece of bridgework and indulges in a few beautiful sentences which may lead one, uninitiated, to expect a piece of work perfect in every detail, the same author winds up by illustrating his result with a piece of work deficient from every point of view. He ignores the extent of the proper labio-lingual restoration; he ignores the line and direction of stress; the important interdental spaces; the vulnerability of the gum margin, etc., and perhaps, too, the occlusion is worse than poor and articulation greatly interfered with. The two latter points cannot be proven because they are not shown in the illustration. (Richardson's *Mechanical Dentistry*, seventh edition, 1897, pages 576-587, Williams; 587-589, Knapp; 589-593, Low.)

Right on through various editions of these works, the editors keep quoting and illustrating the same unsound methods leading to the same unsatisfactory results. The latest editions of Richardson, Harris, American System, fairly reek with page upon page of worse than useless and lamentably crude, as well as faulty technique of bridge construction.

One of the worst features of this chaotic jumble is that it reads well and sounds well, and the pupil cannot realize that it is all wrong until he is confronted with the result of what he has constructed while following the text. Even then he fails to see the shortcomings of the appliances until his patients return (if they do) minus one or more valuable teeth.

The men who produce the specimens of bridgework herewith shown, all received their initial instruction in various dental schools of the United States, East, West, North and South. Each of them

used one or more of the books quoted, and just how thorough was the knowledge they obtained at these schools, and from these books, anyone may judge after examining these creations. It would seem, too, that so deeply did the lesson they received become impressed upon them, that during an active career of dental practice, covering a period of from ten to twenty-five years, they have been unable to unlearn the infernal teachings of destructive bridgework which they have imbibed, and substitute therefore a common sense system based on a somewhat better knowledge of what is required in order to bring about a period of constructive bridgework instead.

The practice of the bridgework of today is, with the great majority, the result of a viciously unsound knowledge gained from volumes of misinformation and entrenched behind that formidable fort—the direction of least resistance. The consequent years of malpractice are alone due directly to the misconception gained from these volumes, and make a combination of diseases not so easy to overcome.

Neither is the present status of the knowledge of bridgework and its kindred divisions in any true sense a matter of evolution, in fact, no more or no greater relationship exists between bridgework as it is, and bridgework as it should be, than there is kinship between orthodontia as it is and orthodontia as it was; both the former as it is today, and the latter as it was years ago are blots upon the escutcheon of anything which heroically lays claim to the title of science.

In view of all the foregoing, it would seem wise that they who practice crown and bridgework should carefully avoid that which is speculative, problematical and doubtful, and devote themselves to that which is definite, axiomatic and true.

There is always one good way of doing any one thing, there are always a great many ways which seem good, but there is always one way which is good.

A multiplicity of methods is, therefore, unsettling, not desirable because the results are uncertain.

This does not mean the cessation of experiments, but rather a close study of new things which are submitted from time to time, in order to determine their value before they are applied to the mouths of our patients. This means that we must be equipped with

the necessary knowledge to enable us to judge as to what the requirements of a case may be, when that case presents itself to us for treatment, and that we must look at this case in a comprehensive manner, not considering each tooth as an organ standing alone, but as an organ which is to interplay with the rest of the teeth in the mouth, and the other tissues in the oral cavity, and right in line with what I have said as regards the multiplicity of methods being undesirable for the reasons mentioned, I would say that the methods advocated by Dr. Thornton for the restoration of single crowns, are unduly and unnecessarily multiple. The practitioner will be better equipped to serve his patient by adhering to one method of supplying these teeth, and that, in my opinion, is the cast base method, than he would be if he carried out all the methods mentioned by Dr. Thornton. The conservation of the root, the permanency of the appliance, the more perfect continuity between appliance and the root, which may be obtained by the casting method, can hardly be equalled by any other means.

I agree with the essayist with regard to the extirpation of pulps when teeth are to be crowned with gold or any other metal, but I would urge the profession to use shell crowns as sparingly as possible, because of the difficulty of obtaining a perfect continuity of surface between the natural tooth and the artificial crown. I am earnestly opposed to the substitution of lost teeth by means of "fixed bridgework" and I believe that the day is not far hence when a man who will persist in placing these disease creating abominations into the human mouth will be criminally liable and professionally ostracized. We must understand that as far as teeth are concerned the masticating apparatus consists of organs of incision, prehension, and trituration. That the various teeth which perform these various functions are meant to resist stresses applied in different directions, that a central is never called upon in Nature to be subjected to the latero-rotary stress of a molar, that the stress usually withstood by a bicuspid is foreign to the environment of a lateral and that a cuspid resists a stress peculiarly its own. We must, furthermore, understand that with all the tissues in the rest of the body, the gum tissue is supposed to be subjected to a certain amount of exercise, as are all the tissues in the oral cavity, and that it is essential for this exercise that the teeth mentioned be enabled to

carry on their function individually and unhampered by fixation of any kind. We could readily see from the foregoing, that any piece of artificial work which will fix teeth subject to different stresses into a more or less immovable mass, must ultimately result in the loss of the teeth acting as supports for this bridge, and we can also realize that no gum or alveolar ridge exercise is possible in fixed bridgework. The difficulty of keeping these fixed bridges absolutely clean is another important reason why they should not be used and why removable appliances should be substituted. The mechanical function of any abutment for a bridge is twofold—first, it must insure the prevention of vertical displacement of the artificial appliance; second, it must interplay with the artificial appliance in such a manner that it (the abutment) will be effectually prevented from migration into any direction other than its natural relation with the adjoining and opposing teeth, and this is all that should be expected of any abutment for bridgework. The stress of mastication and trituration must be transmitted from the artificial teeth to be borne by the alveolar ridge covered with the gum tissue.

This means, of course, that a saddle of varying extent is to be applied and that this saddle must be removably attached to the abutment, and that these attachments must be joined to this saddle in a position and condition of extreme masticatory stress, which is easily accomplished in the following manner: Place the attachment into the tooth acting as abutment, place the saddle upon the alveolar ridge and force it down or up, as the case may be, until the tissue beneath it ceases yielding. While it is held in this position, the assistant places some thickly mixed and quick-setting plaster paris in this position. When the plaster has hardened the pressure upon the saddle is released, the impression, the saddle, and the attachments are imbedded in the relation in which they are held in the impression, into soldering investing material and finally joined to each other. Only one attachment at a time is joined to the saddle, so that if there are two, or three, or four attachments to this bridge, the operation outlined will have to be repeated two or three or four times, as the case may be. After the required number of attachments have been joined to the saddle, the assembled piece is placed into the abutments in the mouth (after, of course, having been properly cleansed) and forced home.

the resiliency of the gum tissue will now assert itself and slightly force the attachments out of the abutments by means of exercising a pressure against the saddle, and these attachments will only be completely seated in the abutments during the exercise of masticatory stress. This, of course, means that the relation of the piece to these abutments and their relation to each other, must be parallel and that this parallelism must be more absolute as the abutments are closer together. In other words, while it may be permissible to have 1/1000 deviation from the parallel, when the abutments are 25 M.M. or over apart, such a deviation from the parallel would be ultimately disastrous to the abutments, if they were only 10 M.M. apart. For this reason the greatest care and the utmost precision of instruments are necessary in doing this sort of work.

The necessary instruments are obtainable, and we should not hesitate to spend the necessary time and give the work the care required.

The class and kind of work required for the human mouth when it needs our attention is not difficult for any intelligent man to master; it seems difficult because we have been doing the wrong kind of work so long that the right kind seems impossible of attainment.

Shall we, as a profession, impatiently throw off the retarding and misleading dogma which has crippled untold thousands, and shall we substitute for it the kind of work based upon the knowledge of physical principles involved, or shall we wait until this wave of intuitive realization, which is sweeping over the land and teaching humanity to know, will make the public tell us what we should have told them?

And now I want to, if I may, call Dr. Leon Williams' attention to an error he is making when he states that there is no principle of harmony in nature.

Everything in nature tends ever to a fuller expression of life, and a full expression of life implies completeness and completeness implies happiness, and happiness implies harmony, and harmony implies proportion, and proportion implies beauty, and so life, real life and completeness and happiness and harmony and proportion and beauty are synonymous, and since there is one, there must be the

other, so since nature teems with efforts to more fully express life, she also incessantly strives for harmony.

This is part of the law of growth and is as inviolate as other natural laws; for example, the law of evolution and cosmic progression.

The enumeration of the important attributes of a piece of bridgework, named in the sequence of their importance, by Dr. Bush, interested me mainly because the doctor is connected with a school in a teaching capacity, and because I suppose he thinks the student derives considerable advantage from considering this work in this particular light.

As a matter of fact, no bridge could lay claim to being physiologically perfect unless it were mechanically perfect, because we must understand that the mechanical part of the work begins with the thorough elimination of root-canal contents of those teeth which are to serve as abutments, and that is a surgical procedure, which, of course, is nothing but intelligently applied mechanical procedure, likewise no bridge could be physiologically or hygienically perfect unless it was anatomically perfect, because no maintenance of hygienic or physiological balance is possible, unless a perfect anatomical restoration is possible, without a mechanically perfect piece of work having been constructed. All of which should bring home to us the close interdependence of the things mentioned; perfection means what it means, not only part of what it means. We must learn that work is perfect when it is conducive to health, and it is conducive to health only when it is perfect, not in one detail or department, but in every way.

If there are five things which the work must essentially possess in order to be perfect, the sequence of these things is of no importance. If one of the essential features is lacking the work is no more conducive to health, and so it lacks that which would make it an accessory to the livingness of the microcosm.

The answer might be made by some that we cannot reach perfection and must do the best we can, to which the truthful retort would be that that is a limitation put upon the human hand by human brain and that constantly evolving humanity must get ready to unlearn that comforting proverb of the inefficient and lazy, "to err is human" and its satisfying sequel, "to forgive, divine." We

must learn to demand more of ourselves, and we shall obtain better results, and so as our results grow better, we shall gradually find them reaching a stage when they shall be an acceptable compliment to impaired or interfered-with livingness, and our results or work will function with the tissues, and be the cause of recreating a harmonious interplay of all functions contributing to the expression of perfect life.

This may be ideal—it is! but shall we say that because it is ideal, it is not desirable?

At the conclusion of the formal discussion, DR. J. H. PROTHERO, Chicago, was called upon to take part in the general discussion. He said:

Mr. President, Members of the Illinois State Dental Society, and Visiting Dentists: The speakers of the evening have covered the ground so well, that it is useless for me to enter into any discussion of the subject presented. I simply want to say to you, it has been a pleasure to me to assist in carrying out the enterprise, as it has been exhibited here at this meeting today and day before, and of the two days that are going to follow, and I am sure that every one of us have enjoyed the pleasure of the company of the members from other states.

I thank you all for the kind attention that you all have given to the section on full dentures today, and I am sure you will appreciate the work that will be presented by the various men tomorrow. (Applause.)

THE PRESIDENT:

Dr. Roach is called for.

DR. F. E. ROACH, Chicago:

Mr. President: I think it is an imposition on this audience to call on us home boys when there are so many talented visitors present. You get tired of us because you can hear us so often. I am very much interested in this subject, and I would like to say a good deal in discussing Dr. Thornton's paper in particular, but I am so thoroughly in accord with practically everything he has said, that I believe the best I can say is amen to all that the paper contains. The late hour forbids any discussion. I wish, personally, to thank

Dr. Thornton for his splendid paper and the President for calling upon me.

THE PRESIDENT:

Dr. Goslee has been called for.

DR. HART J. GOSLEE, Chicago:

We have occasion to take pride in having had presented to this Society tonight, four such masterly orations as these to which we have listened. I am proud to be a member of this Society; I am proud of the success of this meeting, which is due largely to the energy and enthusiasm and indefatigable work of the President, and to the persistence and co-operation of gentlemen who have come from a distance. I cannot take exception or disagree with a single statement which has been made by the essayists of the evening.

Mr. President, I shall not detain the Society any longer with remarks, as it would only be presumption on my part without having made some preparation, but I thank you for this opportunity of addressing this audience. (Applause.)

THE PRESIDENT:

We will now listen to a former President of the Society, who resides on the Pacific Coast, Dr. Garrett Newkirk, Pasadena, California. (Applause.)

DR. NEWKIRK:

Mr. President and Members of the Illinois State Dental Society: Let me say that while I am *from* California, I am still *of* Illinois.

It seemed for a time that I could not come to this meeting—so many things—distance, time of year, business, and illness in my family, seemed all to conspire against it. So I wrote to Dr. Johnson. But the pressure from without and within me was too great for resistance. Then I wrote again to my friend, C. N., that he should see Matthew 21-29. Possibly he did not know where to find it (laughter), so he had his daughter look; and discovered the words: "And afterward he repented and went."

I am glad to be here. I do not know when I have been quite as happy as I am today, after fourteen years of absence from the

meetings of this Society, being unavoidably kept away. I have longed to be with you every year, thinking of you at every meeting, praying for you in my heart for success, and my prayers have been abundantly answered. It is really marvelous to me to think that I stand here today on a platform before the greatest meeting that has ever been held in any part of the world by the greatest State Society that was ever organized and held together. (Applause.) I had the honor and privilege of being the Secretary and President of this Society, and I count it a great privilege to have done something in the earlier days in helping to carry it on. As I have said, I am glad to be here; glad to look into your faces; glad that this meeting has been such a tremendous success. There are just two things that have contributed to make this meeting so successful. In the first place, you have all pulled together. Second, there is a spirit of brotherly love, kindness, helpfulness, which has permeated your work. It is the spirit of the founders of the Society, always predominant. This city is the geographical, commercial and intellectual center of the greatest productive region on earth, from Canada inclusive to the Gulf, from the mountains of the West to the mountains of the East, and we are all happy units in these great possibilities. (Applause.)

THE PRESIDENT:

I will now call upon Dr. Thornton to close the discussion.

DR. THORNTON (closing):

The hour is so late that I do not care to inflict anything further upon you. I do not often tell a story, but perhaps I can close the discussion by telling one. I have been accused of not being constructive, but rather destructive. It is an old saying that a critic should be above criticism. How could I have settled the sociological question when my friend who found fault with me only touched the fringe of it. He talked about men having four or five children. Let him come to Quebec. (Laughter.)

Shortly before I left Montreal I heard the story of a French-Canadian who came over to this country and lived here for twenty-five years and then came back home. The French-Canadians are a lovable people to live with. He met one of the boys with whom he went to school and said to him, "How goes it? I suppose you are married?" "Oh, yes." "Very big family?" "Not very big—

just seventeen. I suppose you are married, too?" Oh, yes." "Any family?" "Yes, a small family. They do not have very many children over in the States. I have only got three." (Laughter.)

These are some of the sociological questions we have to settle in the Province of Quebec. I did not try to bring cosmos out of chaos. It took Infinite Power seven days to do that, and I have only a few minutes time at my disposal. (Roars of laughter.)

Some years ago I learned a lesson in modesty. I read the great sculptor, Michael Angelo, always carried a lighted taper in his hand, so that no shadow of himself might fall athwart his work, and I have tried to keep myself in the background and have simply presented to you great principles for your solution.

I see my friend Dr. Ottolengui here, and I remember very well at the great meeting of the Odontographic Society held here; in a somewhat peculiar way he said he never made a statement that he did not have a string on it. He made a statement last night that there is no necessity for having a string attached to it, and it is this: "We must strive to do better work and bring about a better technic." That is a problem not yet solved. It is the great problem of restoring anatomical articulation in every restoration of every nature that we put in the mouth, and the man that preaches that in season and out of season will accomplish something. All other work will sink into insignificance if we can produce something that will harmonize with the great work of the Creator which we see in every human mouth. I thank you. (Applause.)

ODONTOLOGICAL SOCIETY OF CHICAGO.

A regular meeting was held March 10, 1914, with the President, Dr. L. L. Davis, in the Chair.

Dr. W. V-B. Ames read a paper entitled "Possible Sterilizing Properties of Filling Materials."

DISCUSSION.

DR. C. S. CASE:

This is a purely scientific paper in every degree. It comes from a man whose reputation throughout the profession is known to be one of perfect honesty. Therefore, it must be a very valuable

contribution, and when it is published, as dentists are given an opportunity to study its principles, I am sure it will exert a powerful and progressive influence on the dental profession.

DR. J. G. REID:

I wish to say candidly and truthfully, that it has been a great many years since I have listened to a paper out of which I have obtained so much information in so short a time as in the one presented by Dr. Ames.

The use of cements has been puzzling to me as long as I have had to do with them, and I guess they have also been puzzling to most of you. We have pinned our faith a great many times to cements and the disappointment has been great, and we are only just beginning, apparently, from these observations, to learn something about them, and I take it, the question is not even in the mind of the essayist fully settled, nor can he furnish the full proof as yet, but he has advanced so far as to give us some encouragement and we are learning some things we did not know heretofore. This paper has to me been most useful and very interesting and has really put me in a position where my mind is clear, whereas, heretofore, it was very obscure regarding this question. The paper is a most valuable contribution to dental literature, and it deserves the attention of investigators, and it ought to be distributed in some way for general reading. I want to thank the essayist personally for his admirable contribution.

DR. TRUMAN W. BROPHY:

Dr. Ames remembers away back in the early eighties when the question of capping pulps and filling roots was so warmly discussed by members of the Chicago Dental Society and the Illinois State Dental Society, when the use of oxychlorid of zinc in covering exposed pulps was advocated by certain men. Dr. Atkinson, of New York, was the first, I think, to advocate the use of oxychlorid of zinc in covering exposed pulps. His views were taken up and carried all over the country, so dentists almost everywhere began to put oxychlorid of zinc on exposed pulps. A great many of them gave no trouble. Following my first paper on "Capping of Exposed Pulp," before the Illinois State Dental Society, that splendid practitioner and logical debater, Homer Judd, declared, when it was said that a capping of oxychlorid of zinc as a pulp cap-

ping gave no trouble: "They gave him no trouble, but the quiet that follows the application of oxychlorid of zinc is the quiet of death; the pulps are mummified; they become sterile; they do not cause an infection; the tooth remains quiet, and the doctor thinks he has preserved the pulp. He has preserved it; he has pickled it."

So here, away along in the second decade of the next century, comes a man and tells us that if the oxychlorid of zinc can be carried into a tooth the liquid content of that tooth, the organic matter, is mummified. What the great Judd declared empirically, the great Ames has demonstrated scientifically.

I am not much given to overstating things. I do not think my friends will give me credit for doing that, but I do want to say now that if Dr. Ames had never read a paper in his life until now; if he had been an apathetic member of the profession until now, the paper he has read tonight has in it enough merit to make him distinguished as a scientific investigator and worker for the uplifting of the profession. I say this with all the sincerity I have in me. The work of Miller in the field of bacteriology settled important questions. The work of Rouse, which is now being done, will startle a great many members of the profession when it is known. The work of Ames in bringing to the dental profession pure science—that decalcified dentin which occurs may in part be allowed to remain and protect the sensitive pulp, that it may be sterilized and become a hard solid substance capable of so remaining until the end of life, is a lesson in science and art of practical value to the laity and the profession generally.

This paper is very valuable. Its teachings will be carried everywhere. It is a pity that the great surgical congress which is to convene in London had not been selected as the place for the reading of this paper. Although read before this small coterie, the paper will have a greater audience when it is published. There are 40,000 practitioners of dentistry in America, a greater number than can be found in any four countries on the globe. This profession of ours will profit by the teachings that cavities in teeth must be sterilized before they are filled. I have the notion that one of the troubles all through the ages, more than anything else, has been that we have put fillings in teeth whose cavities were unclean; they were filled with pathogenic micro-organisms which continued

to destroy the teeth after the fillings were put in. I may be wrong. All honor to Dr. Ames for the work he has done. I feel proud of the fact that I belong to a society which has among its members one who is capable of presenting such a purely scientific paper, one that will be so classed and stand as a classic in the literature of the profession.

DR. J. E. HINKINS:

I do not think anyone appreciates the value of this paper more than I do. It deals with biological chemistry, physical chemistry and general chemistry. By some of the latest authors in chemistry it has been conceded that one of the troubles with phosphate of zinc is what is known in chemistry as phosphorescence. By that means there is a kind of oscillating property between the three acids—radicals—and no one is more familiar with the phosphoric acids than Dr. Ames. They will change with heat their properties from the pyro- to the meta- and the ortho- and others.

We also know that in chemistry there are certain likes and dislikes. As an illustration, you can take any salt of iron and bring it in contact with tannin and you produce tannate of iron. That is one of the characteristics of chemistry. You take it in inorganic chemistry and most any of the inorganic compounds by the addition of an oxygen atom, it will give us an oxidation. In taking these combinations and bringing them in contact with organic chemistry we are dealing with a physiological proposition. We all know in a root-canal filling with chloro percha we have none of the properties thrown off of which Dr. Ames has spoken here tonight in this chemical proposition.

As to how this substance acts, it is a question of one of three things, and they may be all wrong. The old chemical theory of the oxychlorid of zinc was the nascent chlorin which took care of the organic matter in the pulp chamber and preserved it. As Dr. Ames has shown, with the iodid of mercury and phosphate of copper, it is possible that it is the nascent iodine which is liberated, and the iodine of mercury which acts as a preservative and the catalytic effect between the organic matter and the inorganic matter preserves these teeth. On the other hand, it may be from the escharotic or from the efflorescent properties of the mercury in a nascent state in the pulp chamber which will give us the chemical state.

When we go back and notice the specimens which he has shown here—and I have very pronounced in my mind the specimens Dr. Parker showed me of some temporary teeth he filled with oxyphosphate of copper, where they had thrown out that substance over the pulp chamber—I am inclined to believe that there is a biological chemical action which takes place there between the metals and the organic matter. In other words, there is a reorganization of the multicellular and intracellular tissue superinduced by the action of the protoplasmic cell. I cannot get at that any better than to speak of the polymorpho-neutrophile when in its work it tries to absorb the poisons in the blood, and if it cannot go around the cell, so to speak, or the cavity around it, it goes up to that and again takes up its ameboid movements, breaks up, and goes clear around it and absorbs it. If it cannot attack it in that way, it will throw out a substance which will make it more palatable and be absorbed in that way. This oxid of copper or of the mercury may have the same power of throwing out this substance which will combine with the protoplasm of the cell or reorganize all multicellular tissue and form the product Dr. Ames spoke of.

Dr. Ames has given us a very valuable contribution to dental literature, and we are indebted to him for presenting it to this Society.

DR. R. J. CRUISE:

I cannot say that I am capable of entering into any discussion of this admirable paper. I have thought along that line, and I also agree with Dr. Brophy that Dr. Ames has given us something tonight that will open the eyes of the profession, and that this subject will be taken up and heard from.

The paper is timely, as it comes just as we are having a lot of unscientific commercial nonsense given to us on the subject of oxyphosphate of copper, which our profession is, perhaps, too ready to accept as correct.

As Dr. Brophy truly says, whatever Dr. Ames gives us is given with the sincerity of truth, and the accuracy of science, and I believe that this paper is going to prove of great interest, and will be highly appreciated by the dental profession.

DR. L. L. DAVIS:

There is just one thought in my mind in regard to this paper

and that is its timeliness. It comes at a time when we are shouting for sanitary root canals, freedom from blind abscesses and such like, and if there is any merit in the paper it is the fact it has been brought forth at this time. I believe it is going to make possible the retention of teeth without physicians even placing the ban upon them. The paper will produce great good in the profession, and I wish to thank Dr. Ames for having the opportunity of listening to it for the first time.

DR. AMES (closing) :

I need to admit that I consider that the bringing of this matter before the profession in the way I have brought it tonight, is timely. It is unfortunate that some moves on the part of the National Dental Association and some state societies looking to investigations which would include such results as I have shown tonight, have not been sufficiently supported to make them the means of heading off or discouraging from fear of exposure, the giving out of so much misinformation, and the marketing of so many untried products.

If it could be brought about that a material to be accepted by the large majority of the profession must be passed upon by a competent investigating committee representing the National Dental Association, the dentist's patient would be much better served. This being too utopian, I fear, to be expected during the life of anyone here, it is up to an occasional more or less unselfish investigator to correct some of the worst situations when they become so flagrant that an exposure is easy.

The gullibility of the average professional man is equal to that of the average layman, and history can repeat itself in rapid succession when the desire of the operator to obtain a reliable translucent cement or a white germicidal cement is played upon. I am, however, not a pessimist, and I expect to see the practice of dental medicine and surgery made easier for the operator and of yet more satisfaction to the patient. I also hope to see within my lifetime a considerable advance toward that Utopian state in which the conscientious operator will have the assistance of a properly supported and authentic investigating body.

Dr. Hinkins brings up the question of the possibility of change in phosphoric acid from meta phosphoric to pyro and from pyro to

ortho phosphoric. It happens that these changes are never automatically reversed, and it happens that reliable cements are all compounded from orthophoric acid so, therefore, no change will take place.

I hope to see more attention to the properties of oxychlorid of zinc. There is a large possibility of exercising judgment in the discrimination between oxyphosphate and oxychlorid for different purposes. Because of the liability of exciting to too great an extent an irritation of a nearly exposed pulp, oxychlorid of zinc may not be indicated when pulp capping or an intermediary layer is called for. There is a large difference, however, between oxychlorid used too plastic and the same material used as stiff and dry, i. e., as basic as it may be and yet be sufficiently adhesive to be properly placed over a nearly exposed pulp. The setting of oxychlorid of zinc may be hastened by gently heating, but it should be given a day or more to set beneath a gutta percha seal.

Oxyphosphate of zinc rendered germicidal by proper additions is more easily manipulated and will set more promptly and therefore is apt to be oftener used as an intermediary or pulp capping. For root canal filling the stringy gumminess of oxyphosphate entirely precludes its satisfactory use, while, because of the working qualities of oxychlorid of zinc, its introduction into root canals is a matter of comparative ease.

I have shown and described results, some of which I cannot entirely explain. These matters have not been threshed out to a finish and it is quite possible that satisfactory explanation may be found for all results which we obtain and which are not now entirely explainable. Further chemical and microscopical work suggested by these results will be prosecuted. It does seem, sometimes, when we see an effect from an infinitesimal amount of some agent that we are getting a catalytic effect.

The work of Paul Ehrlich and some of his admirers and followers, such as Wright and Simon, and their followers, is doing much to explain and accomplish systemic immunity where vitality and nutrition assist or combat the investigator's efforts. With so much accomplished and in prospect in that more difficult field, it is safe to predict that uncertainties connected with these mere chemico histological problems will be cleared away.

THE DENTAL REVIEW.

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EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

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EDITORIAL.

THE ANNUAL PRODUCT.

It is at this time of year that the colleges are turning out their annual product of graduates, and the state boards are sifting them to see which ones are qualified to go before the public to practice. It is possible that in the final test of examinations both before the faculties and the boards some men may be rejected who would really make creditable practitioners if permitted to pass, but the probability is that there are very many more who will receive the approval of the powers that be who are really not qualified to do good service to the public. And it is perfectly natural that such should be the case. Of course the colleges and the boards should stand between the public and that kind of imposition which is represented by incompetency on the part of dental practitioners, and yet there are so many angles to the question that it is not always easy to be perfectly equitable and just when it comes to making a decision as to whether or not a candidate shall pass. In the first place examiners are fallible. They are not endowed with the prophetic vision which can tell with certainty just what kind of a practitioner any given candidate will be. There are so many things entering into the question of a successful practice aside from mere ability to write a good paper in an examination or even to do a creditable operation that it would be a wise man indeed who could rate a candidate accurately.

Some men are so proficient in their examinations that there is little doubt of their availability as practitioners, others are so defective that there is no possibility of passing them, but there are

certain others with some good points to recommend them and some poor points to handicap them, and these are the men who give great concern to the examiners. If at times the human sympathy of the faculty or board results in the admission of men who are not of the highest type of attainment it is not to be wondered at. It is only an error of judgment due to charity of the heart.

And yet there is a grave responsibility in all this. No faculty or board should set its seal of approval on a man who is likely to go out and do harm to the public. To be a conscientious examiner imposes one of the most serious obligations that comes to a man in professional life, and no one should accept a position on a faculty or board who is not prepared to sacrifice much of his own comfort and peace of mind.

But the thing at this time to which we wish to call attention is this. For good or ill, for weal or woe, many young men are entering the profession to leave their impress upon it. The nature of that impress will be largely influenced by the trend they take in the early years of their practice, and the direction of that trend will in no small degree be due to the example set them by older practitioners, and by the treatment accorded them by these practitioners. Every man who has been some years in practice should aim to interest himself in the young men who are just entering the ranks. The right hand of fellowship extended to a young practitioner is a wonderful incentive to right doing, and many a time it has been the turning point of his professional career. A cordial encouragement extended from the older to the younger man does the older no harm and the younger much good, and too frequently this encouragement is withheld merely through thoughtlessness. It never occurs to the older man how much it may mean to the younger to receive a little attention at his hands.

This matter is particularly important in dental society work where the burden must soon fall on the men who are just coming on the scene, and who should receive the proper encouragement and training to take it up. At this season when so many are entering the profession it is a good time to consider these things and to profit by them.

THE EDITOR'S DESK.

A LONE FISHERMAN.

One night last summer while on my vacation I was really and truly a lone fisherman for one night. And at the risk of being called conceited over my own company I am going to affirm that I had a most enjoyable evening. In fact it was one of the rarest treats I have had for years. Not till that moment did I realize how intimately and even intricately my life had become intertwined with that of my fellowman; because this was the first time that I could remember in more than a quarter of a century when I was really alone. It was like this: There seemed no one available who could accompany me, and so I took the paddle, an old tin pail, a cushion, a bailing dish, some worms, a couple of hooks and lines, and climbed through the bars to the path which led down to the landing by the creek. I got in the old boat which leaked just enough to make it interesting and paddled up the winding creek as far as the "upper hole." Running the bow of the boat up on the trunk of a fallen tree I seized some bushes on the bank and drawing them under me sat on them, which held the boat securely and made fishing comfortable. The river twists and turns between banks lined deep with the densest brush, making a very fairy-land reflected in the water. At this hour of early evening it was exquisitely beautiful, and after I had paddled less than half a mile I was as remote from the marks of man as if buried in the jungles of Africa. Here I was absolutely alone with nature and the experience was unique. Not a harsh or human sound jarred on the ear, though there was much to hear and to see. Abounding in animal, bird, and insect life the river is a never ending source of entertainment to me, and this evening I had it all to myself. A pert and plump little wren hopped about from twig to twig among the bushes, busy with her evening meal. A kingfisher alert and swift as an arrow flew across the stretches of water darting here and there like a flash, his sharp beak aggressive and insistent. The shadows under the bushes along the

banks grew darker as the shades of evening fell. A flock of wild ducks flew over head, at least a dozen of them, great, black, vigorous fellows going like the wind with necks stretched straight out and round fat plump bodies. A long ungainly and lanky crane squawked his way across the marsh, while in the edge of the stream the frogs were leaping back and forth.

The sun had long since dropped beyond the horizon, and in the surface of the water was mirrored a pale thin disk—the reflection of the new moon just peeping from behind another planet. It seemed as if I had never seen the moon so very young as this. Thin, clear-cut and delicate as the rim of a maiden's ear it hung in the sky as if sketched by the Master of all Artists, a pattern for the world of art to aim at.

As the shadows deepened a wake far up in the distant bend of the river showed where something was swimming. I almost held my breath lest I might disturb the swimmer, and diagonally across the stream came a muskrat almost straight for the boat. Suddenly he changed his course toward the other shore coming along broadside to me and evidently oblivious to the fact that an intruder was watching him. Surely the river was alive with life and the hour was favorable for its delightful observation. I have seldom been so royally entertained, and as the night-fall forced my retreat I baled out the boat once again and regretfully turned her prow down stream. The darkness lent a fascination to the homeward trip, winding abruptly about the bends under the overhanging boughs, dodging fallen logs and sweeping at last into shallow water where the bow of the boat grated on the sand at the landing. By this time it was very dark and I groped my way up the bank toward the house, happy and content, lugging all my paraphernalia and a great pail of fish—oh yes, I almost forgot, the fish had bitten splendidly that night and I had a fine catch—but that was merely an incident of the trip. My only dilemma of the evening was when the muskrat was swimming along by the boat there was a fish biting vigorously—almost viciously—at my hook, and I dare not pull him in through fear of frightening the muskrat. Which in all conscience was dilemma enough.

PRACTICAL HINTS.

Edited by J. E. Schaefer, D. D. S.

(This department is for busy readers. We want short articles containing practical hints—the shorter the better. No article must exceed 200 words, unless of exceptional merit. Every dentist has some useful hint that has been of value to him, and if he will only put it in print it may be of equal value to others. That is what this department is for. Due credit will be given for every article sent. Address J. E. Schaefer, 1745 W. Harrison St., Chicago, Ill.)

Investing Inlay:—In painting wax inlay models with investment material have the brush thoroughly *wet* with plain water before starting to apply the creamy investment material. This will avoid many small air bubbles on the finished casting.—*A. G. Smith, D. D. S., Peoria, Ill.*

Casting Inlay with Pin:—When casting gold on to a pin, as base for detachable crown place sprue in wax at such an angle that the molten metal when forced into the mould will miss the pin and flow first into the space occupied by the very thin wax (labial), and around the pin. When sprue is placed in line with the pin, the molten metal is divided and cooled, hence imperfect and incomplete labial portion.—*C. B. Mead, D. D. S., Rockford, Ill.*

Lead Poisoning:—Lead poisoning manifests itself in the mouth by the presence of a bluish-black line in the edge of the gum at the cervical margins of the teeth. This is a very valuable sign of lead poisoning if not confused with conditions that resemble it. The black deposit is the sulphide of lead, and is distinguished from tartar by the fact that it cannot be scraped off. It is aggravated by the existence of gingivitis due to tartar, but may be found also in a comparatively clean mouth.—*R. H. Ivy, M. D., D. D. S., Philadelphia.*

Good Soap:—"One of the most gratifying things a dentist can have is a good soap, which after using many times a day, does not leave the hands in a dry, crackling condition. This is pre-

pared by putting five pounds of U. S. P. Green's soap into a five quart plaster pail, fill with water, boil for twenty minutes and let cool slowly. Do not add alcohol for clarifying, but let stand for a few days when the clear amber colored solution can be syphoned off. This is the most satisfactory soap for our purposes that I know of."—*A. G. Loomis, D. D. S., Chicago, Ill.*

Four Years After:—Perhaps it is of as much importance to know what not to do as to know what to do.

Four years ago I began inlaying badly broken down buccal teeth (especially young ones) with "Acolite" and "Westons metal." The material worked nice, looked beautifully, and seemed, in every way ideal and I was enthusiastic enough to clinic with it before the West Side Dental Society, of Chicago.

The metal proved to be too soft. Wherever the occlusion was normal, it wore away perhaps more rapidly than a good cement would. All of the work I did with it I have had to do over again, either with a crown or the forceps and those I have not had to work with some other fellow has.—*C. E. Allen, D. D. S., Chicago, Ill.*

Short Bite Teeth:—I am surprised at being told by dental supply houses that there is more call for short bite teeth than long bite.

The short bite is objectional from every point of view. In the first place it is not needed except in short teeth when it cannot be avoided. Otherwise what is the result? The pins are within a short distance of the incisal margin. When covered with rubber, there is a thick projection, entirely unlike nature, with its concave surface and the tongue realizes it. What object those who use them have in view it is difficult to conceive.

To those of us who avoid them it is sometimes impossible to find certain shaped teeth when they are not short bite.—*L. P. Haskell, Chicago, Ill.*

Treatment of Abscessed Teeth:—The treatment of alveolar dental abscess, with or without sinus in deciduous teeth does not

differ in principle from that in permanent teeth. In cases where the suppurative process is active and pus has found its way through the process into a circumscribed area, surgical opening of the gum and washing of the pocket is indicated. Thorough asepsis must be established throughout the canal. This can be accomplished after the cavity is well opened and decay and food stuff thoroughly removed, by sealing dilute formocresol on cotton into the pulp chamber for twenty-four hours, when the canals can usually be cleansed, and a second treatment made if necessary.—*John F. Stephan, D. D. S., Cleveland, Ohio.*

Pulp Nodules:—These are calcific bodies of varying shapes and sizes, supposedly the result of secretion, and occurring within the pulp, and are rarely, if ever, attached to the dentin. They are found more generally in middle-aged or elderly patients whose teeth have been subjected to such continued irritation, the source of which was mentioned as an etiological factor in the formation of secondary dentin. Black, however, observes that pulp nodules may, and frequently do, form in other teeth of the same denture which are not directly involved in the irritation; and that irritation of the pulp of one tooth very frequently causes a general hyperesthesia of the pulps of all the teeth in that mouth, especially is this true of that type of individuals classed as neuralgic.

The diagnosis of pulp nodules is not always a simple matter. The symptoms are of the subjective variety, and the radiograph does not always confirm the suspicion.—*J. P. Buckley, D. D. S., Chicago.*

Prevention of Shock:—Prevention is more valuable than cure. This holds especially true when we are considering shock—acute or chronic. We as dentists are more familiar with some of the forms of acute shock, for example, the psychic and the traumatic.

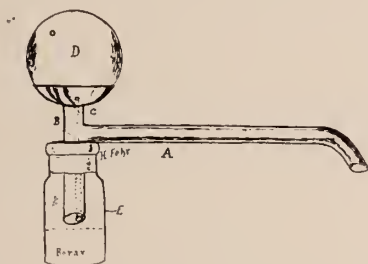
Psychic shock results from distorted, magnified mental images produced by hearing or seeing. To prevent it the art of reassurance must be developed by the dentist, and he might study with

great benefit to himself and patient some standard work on psychology.

Traumatic shock may be prevented by not unduly prolonging operations. Stop far short of fatigue, because shock is simply a manifestation of the fact that a cell, a tissue, an organ, or indeed the whole organism has been subjected to stimuli to a point where it cannot longer respond. The degree of severity of the stimuli will determine how long the response will be maintained. By good judgment, then, we may almost eliminate shock, "a consummation devoutly to be wished." Think it over.—*Clayton F. B. Stowell, D. D. S., Chicago, Ill.*

Flux Atomizer:—By the use of the flux atomizer, flux is spread evenly in small quantities over the area to be soldered. This prevents the checking of facings and pits in the solder, caused by the excess amount of flux. This atomizer is very handy as flux can be directed on the part to be soldered.

The Atomizer can be made by yourself as shown below.



A. $\frac{1}{4}$ -in. brass tubing $4\frac{1}{2}$ in. long with slight curvature at end. Tube B, 2 in. long of same thickness through which an opening is made and soldered to tube A. C, a chip blower placed inside of tube B and soldered to it, on this tube a round rubber bulb is placed, the bulb has a small opening in which air can enter but when using the thumb will be placed over it. E is a small bottle, through the cork is an opening for tube B. The bottle should be filled one-third of powdered flux.—*H. F. Fehr, C. C. D. S.*

MEMORANDA.

[Society notices will be given insertion in this department free of charge. Subsequent insertions will be charged for at the rate of \$2.00 an inch.]

TENNESSEE STATE DENTAL ASSOCIATION.

This society will hold its Forty-Seventh Annual Meeting at Chattanooga, June 25-27, 1914.

EUROPEAN ORTHODONTIA SOCIETY.

Seventh Annual Meeting, Paris. Grand Hotel Continental, 3, Rue Castiglione. Tuesday, July 28, Wednesday, July 29. Clinics. Saturday, August 1. G. Lind, Secretary, Amsterdam 542 Keizersgracht.

DEATH OF DR. T. G. THOMPSON.

Dr. T. G. Thompson of Cavalier, North Dakota, died suddenly March, 22, 1914, at his home in that city. He was a member of the North Dakota Dental Association, a member of the Presbyterian Church and a Master Mason. He leaves a wife and eight children—six sons and two daughters.

NORTH DAKOTA STATE BOARD OF DENTAL EXAMINERS.

The next regular meeting of the North Dakota Board of Dental Examiners will be held at Fargo, North Dakota. July 13, 14, 15, and 16, 1914. All applications for examinations must be in the hands of the secretary by July 3, 1914. For further information apply to F. A. Bricker, secretary, Fargo, North Dakota.

OKLAHOMA STATE DENTAL SOCIETY.

The following officers were elected by the Oklahoma State Dental Society at its recent annual meeting: President, J. M. Temples, Tulsa; vice-president, J. H. Sims, Watonga; secretary, C. R. Lawrence, Enid; treasurer, A. B. Walker, Fairview. The next annual meeting will be held in Oklahoma City about March, 1915. C. R. Lawrence, Secretary, Enid, Okla.

IDAHO STATE BOARD OF DENTAL EXAMINERS.

The next regular semi-annual meeting of the Idaho Board of Dental Examiners will be held at Boise, Idaho, on Wednesday, July 1, 1914, at 9 a. m. in the State Capitol building. Applications for examination must be made before July 1. For blanks and further particulars apply to Dr. A. A. Jessup, Secretary, Boise, Idaho.

MONTANA STATE BOARD OF DENTAL EXAMINERS.

The Montana State Board of Dental Examiners will hold their annual meeting in Helena, Montana, July 13 to 17, 1914, inclusive. All applications must be in the hands of the Secretary 10 days prior to the opening of the meeting. Examination and license fee, \$50.00. For other information and examination blanks address the Secretary, Dr. Gilbert A. Chevigny, Clark Blk., Butte, Montana.

NATIONAL MOUTH HYGIENE ASSOCIATION.

A series of illustrated lectures on Mouth Hygiene is being prepared by this Association for rental service. The first lecture of the series, a talk suitable for a mixed adult audience or school pupils above the age of twelve years (designated as lecture "A") is now ready. The lecture set (manuscript and 36 lantern slides) will be furnished to members of state dental societies and others who may be considered as competent to present the matter to the public, at a rental of one dollar per use. For further particulars and application blanks, address, Edwin N. Kent, D. M. D., 222 Washington St., Brookline, Mass., U. S. A.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

The thirty-second annual session of the National Association of Dental Examiners will be held at the Rochester Hotel, Rochester, N. Y., beginning July 6th, at 10 a. m. and continuing until adjournment.

Every State Board holding membership in the Association is earnestly requested to have at least one representative present at this session. Members of all State Boards are invited.

Hotel reservations should be made immediately, as the National Dental Association meets in Rochester during the week beginning July 6th, and the attendance undoubtedly will be large.

T. A. BROADBENT, Secretary, 15 E. Washington Street, Chicago, Ill.

XI PSI PHI FRATERNITY NATIONAL ALUMNI ASSOCIATION ANNUAL MEETING.

"Good-fellowship, not Politics." Place: Rochester, N. Y. Date: July 6th. All functions will be held on this day so as not to conflict with the sessions of the National Dental Association. Headquarters: Hotel Seneca. Register on arrival in the Xi Psi Phi Parlor on the Mezzanine. An entire floor has been reserved for our members. Functions: Annual dinner in the large banquet hall of the hotel at 6 p. m. Members of international respect will do the toasting. Be sure to send your acceptance without further notice to Dr. George C. Lowe, 813 Chamber of Commerce Bldg., Rochester, N. Y., so that reservations may be made for you. This is important so that the correct number may be provided for. The Annual Business Session will immediately follow the banquet. Matters of the utmost importance will come up for disposal and your presence is, therefore, strongly urged. Membership Committee: Kindly get in touch with Dr. C. C. Markey, 1436 Peoples Gas Building, Chicago, Ill. C. O. Simpson, Secretary, St. Louis, Mo.

DR. BUCKLEY AT SULLIVAN, ILLINOIS.

Dr. J. P. Buckley of Chicago, delivered a very interesting lecture on "Teeth and Health" in the High School Auditorium, at Sullivan, Friday evening, April 17th. The meeting had been well advertised by T. H. Finley, Supt. of City Schools, and the room was filled to its capacity with a mixed audience, who thoroughly enjoyed and appreciated the lecture, which was preceded by a musical program, rendered by an orchestra and members of the school. The dentists of the city entertained the physicians, the County Superintendent of Schools, the Superintendent of City Schools and the President of the Chamber of Commerce at a six o'clock dinner in honor of Dr. Buckley. After dinner all went in a body to the place of meeting. After the lecture, those who had taken dinner together held an after-meeting until 11:30, when Dr. Buckley left for Chicago. The program for this meeting consisted of a paper by one of the physicians on "Systematic Effects of Diseased Oral Conditions," followed by round table talks and good fellowship. The meeting was full of interest and enthusiasm until the last minute.—S. T. BUTLER.

BALLOONIST KILLED ON CAR.

Pittsfield, Mass., May 10.—Dr. Sidney S. Stowell, a past President of the Massachusetts Dental Association, and a noted balloonist, was killed to-night on a trolley car near Pontoosuc Lake. He leaned from the car and was struck by a pole carrying the overhead system. His skull was fractured. He was 52 years of age and a graduate of the University of Pennsylvania.

Dr. Stowell qualified as a balloon pilot in 1908, and was licensed by the New England Aeronautical Association. While on a balloon trip with Miss Banche Hulse of Brooklyn in 1909, he proposed marriage when above the clouds and was accepted. In his elation he was prompted to perform a feat fraught with great risk. He deflated the balloon at 5,000 feet altitude and parachuted to a landing. This adventurous act never has been repeated by any American balloonist. Soon after this ascension, Dr. Stowell and Miss Hulse were married. In 1909, with William Van Sleet, Dr. Stowell made the longest balloon trip ever made from Pittsfield, landing at Eastport, Maine. Since then he had given up the sport.—*New York Times*.

INTERNATIONAL ORAL AND DENTAL HYGIENE CONGRESS.

Lyons, September 24-28, 1914.

Hygiene in general—and oral hygiene in particular—are developing every day to a greater extent, in relation with the scientific knowledge of this branch of the art of healing. We have thought that a congress of oral and dental hygiene ought to find a place among the numerous general hygiene congress to be held in Lyons during the international Exhibition in 1914.

Preparations for this congress are being made under most favorable circumstances. Most distinguished scientists are giving their patronage. The very coincidence of this congress with the great urban Exhibition organized by the city of Lyons cannot but be another element of success for our meeting, especially as a separate *class* has been set aside for dentistry.

We desire to appeal unto all workers in the field of diseases of the mouth and teeth, and have thought that on the ground of Hygiene we could meet and exchange useful and profitable ideas, both for ourselves and our patients, leaving aside entirely all matters of professional politics.

The congress will include active members and associate members (congressists' relatives). Dues are fixed at 15 francs for active members and 5 francs for associates.

Numerous advantages will be reserved to members. The committee on organization is preparing festivities, official receptions and any excursions that might be made. The transactions, papers and discussions will be published after the congress and forwarded free of charge to members.

We do not believe it necessary to further insist upon the importance of this congress both from the general professional standpoint and from that of each member. In the name of the Committee on Organization we beg to solicit your inscription as an active member.

We hope that you will, at your earliest possible convenience, forward your application for membership and the title of the papers you are keeping for the congress. With confraternal greetings we beg to remain, sincerely yours, Dr. A. Pont, Pres., Dr. G. Vichot, General Sec'y.

Applications for membership, titles of papers and dues (15 francs for active members and 5 francs for associates) should be forwarded to the General Secretary, Dr. G. Vichot, 6 rue de la Barre, Lyons.

P. S. A Ladies' Committee will gladly receive our confreres' wives, and will try to make their stay in Lyons during the congress as pleasant as possible.

THE FORSYTHE DENTAL INFIRMARY FOR CHILDREN.
BOSTON, MASS.Permanent Staff, Appointments for Half Time Service.
Salary, \$300 per Year.

The appointments for this service are open to men and women graduates in dentistry, and offer unusual opportunities for clinical work in dental prophylaxis, orthodontia and oral surgery, in the best equipped and most modern institution of its kind in the world. Appointments will be made for one year as follows: Half time service, requiring twenty-four hours per week, salary \$300; one-third time service, requiring sixteen hours per week, salary \$100; and will be made subject to satisfying the requirements of the Massachusetts State Board of Registration in Dentistry. A diploma of service will be issued to those who have completed their turn to the satisfaction of the Trustees. Members of this staff will be entitled to the advantages of reports and clinics by experts in the various branches of dentistry, from different parts of the world. All material and necessary operating instruments will be furnished; up-to-date apparatus, including electric engines, sterile instrument trays, fountain cuspidors, compressed air and modern operating-room-type lavatories will be available for use.

PERMANENT STAFF, SALARY \$1,000 PER YEAR.

Examination of graduates in Dentistry. (of less than three years' standing) for appointments to positions on the Permanent Staff of this Institution will be held at Boston, Mass., on June 8, 1914. The Forsythe Dental Infirmary for Children is an Institution founded by John Hamilton and Thomas Alexander Forsyth in memory of their brothers James Bennett and George Henry Forsythe. This Institution which will have 64 dental chairs is expected to open in the fall of 1914. It is intended to care for the dental needs of 220,000 school children in Boston and its suburbs. The clinical department, splendidly equipped and presenting unequalled facilities for post-graduate study in dental prophylaxis, orthodontia and oral surgery, offers to a limited number of recent dental graduates the opportunity to serve as members of its permanent staff at a salary of \$1,000 per year. Appointments will be made for one or two years. Members of this staff will be entitled to the advantages of reports and clinics by experts in the various branches of dentistry, from different parts of the world. A diploma of service will be issued to each member of this Staff who has completed his term to the satisfaction of the Trustees. Successful candidates for positions on this Staff will be required to pass the examination of the Massachusetts State Board of Registration in Dentistry. Applications for the above positions should be made not later than June 4, 1914, to the Director, Harold DeW. Cross, D. M. D., No. 149 Tremont street, Boston, Mass., who will gladly furnish information to those interested.

NATIONAL DENTAL ASSOCIATION.

TENTATIVE PROGRAM. The National Dental Association will hold its 1914 meeting in Rochester, N. Y., July 7 to 10. The House of Delegates will hold its first session on Monday, July 6, at 11 a. m., and it is important that all delegates be present at this time.

The first General Session will open at 11 a. m., Tuesday, July 7, and the Local Committee have hopes that Gov. Glynn will be present to make the address of welcome. This will be responded to by Dr. B. Holly Smith, Baltimore, Md. The President's address will be followed by an address by Dr. Victor C. Vaughn, President of the American Medical Association.

The second General Session will be held in Convention Hall at 8 p. m.

Tuesday and will be a symposium by the Research Commission with Drs. Weston A. Price, Thomas B. Hartsell and Russell W. Bunting as speakers. At the Wednesday evening General Session Dr. Joseph C. Bloodgood (M. D.) of the Johns Hopkins University, will discuss "The Early Recognition of Pre-cancerous Lesions of the Mouth and Tongue." At the Thursday evening General Session two selected papers will be presented from Sections 1 and 111.

The program for the Section meetings has not been entirely completed, and two or three papers will be added to the following list: Dr. J. R. Callahan, Cincinnati, "Some Phase of Root Canal Treatment"; Dr. W. H. DeFord, Des Moines, "Some Phase of Eliminating Pain"; Dr. E. J. Eisen, Milwaukee, "Dental Radiography"; Dr. Herbert L. Wheeler, New York City, subject to be announced; Dr. Fred W. Gethro, Chicago, subject to be announced; Dr. J. D. Patterson, Kansas City, "Pyorrhea Alveolaris"; Dr. C. H. Oakman, Detroit, "Oral Hygiene"; Dr. Chalmers J. Lyons, Ann Arbor, "The Pathological Significance of Impacted Teeth"; Dr. Dayton Dunbar Campbell, Kansas City, "Some Basic Principles and Methods in the Reproduction of Mandibular Movements"; Dr. Wm. A. Griffin, Detroit, "Technique for Making Impressions and Models for the Construction of Artificial Dentures." Demonstrated with motion pictures: Dr. A. J. Bush, Columbus, "Classification of Fixed Bridgework with Law Governing its Application"; Dr. Carl B. Case, Milwaukee, "Evolution of Root Movement"; Dr. Jules J. Sarrazin, New Orleans, "Properly Constructed Bridges and Their Hygienic Care"; Dr. Homer C. Brown, Columbus, "The Responsibilities of the State Society Officers"; Dr. Otto U. King, Huntington, "The Business Side of the State Society Work."

The Clinic Committee is to present a Progressive Clinic Wednesday morning commencing at 9:30. They have secured a list of exceptionally high class clinicians for both the Progressive and the General Clinic. The General Clinic will be given Friday morning and full details of the clinical program will be presented through the National Bulletin and later journals.

The Local Committee has selected the Powers Hotel as Headquarters and reservations should be made as early as possible. A full list of hotels and rates will appear in the National Bulletin. This Committee has made ample provisions for a large meeting. All except the evening General Sessions will be held at the Exposition Park under most favorable conditions. The superintendent of the Park has assured us that the temperature of these buildings can be regulated so that July weather need not interfere with our comfort.

All reputable practitioners of Dentistry and Medicine are cordially invited to attend this meeting. Otto U. King, Gen. Sec'y., Huntington, Ind.

NATIONAL DENTAL ASSOCIATION.

Railway Passenger Rates, to and from Rochester, N. Y. (July 7-10, 1914). The railways of the Trunk Line Assn. covering New York State (east of and including Buffalo, Niagara Falls, and Salamanca) New Jersey, Pennsylvania (east of and including Erie, Oil City, and Pittsburgh) Delaware, Maryland, District of Columbia, Virginia, and West Virginia (east of and including Wheeling, Parkersburg, and Huntington) have given an open rate of two cents per mile in each direction in their respective territories with the minimum excursion rate of \$1.

Tickets to be sold and good going July 5th to 7th, 1914, and returning to reach original starting point not later than July 13th.

The New England Passenger Assn. covering the railways of New England also grant the above privileges and limitations with tickets

from their principal stations. The agent at other stations will require not less than 48 hours' notice to procure fares and tickets obtainable from the General Passenger Department of the railroad interested.

Eastern Canadian Passenger Assn.—Canada (east of and including Port Arthur, Sault Ste. Marie, and St. Clair and Detroit Rivers) declined granting reduced fares.

Central Passenger Assn.—Territory west of Buffalo, Pittsburgh, Wheeling, Parkersburg, and Huntington to and including Chicago, and St. Louis and north of the Ohio River, including Cincinnati, Louisville and Cairo—have granted a rate of two cents per mile in each direction added to the tender received from Trunk Lines, through fares however not to be higher than the 30 day summer tourist fares to Buffalo, N. Y. plus tender covered.

Signature form of tickets to be sold on July 4-5-6th with return limit to reach starting point not later than midnight of July 14th, 1914, except in border territory common to the Trunk Lines, selling dates July 5-6-7th with return limit of July 13th. Your committee suggests conferring with local agent for excursion rate with longer limit, if desired.

Southeastern Passenger Assn.—Territory south of Ohio and Potomac and east of Mississippi Rivers,—declined granting a concession in rates and suggest that the summer excursion tickets will be on sale daily before the time of meeting, from the principal stations in their territory, reaching Buffalo, Niagara Falls and other points contiguous to Rochester.

Western Passenger Assn.—Territory west of Chicago, Peoria, and St. Louis to and including Denver, Colo., and Cheyenne, Wyo., state that the summer tourist fares to Eastern sections will be available from principal points in their territory. The general basis of fares, two cents per mile in each direction to their Eastern gateways added to the fares over their lines. Confer with local ticket agents.

Southwestern Passenger Association—territory southwest of St. Louis, including Texas, Arkansas, Oklahoma, Missouri (south of Missouri River) and Louisiana (west of Mississippi River) and Mexico, suggest that the summer excursion rates are practically two cents per mile in each direction. Tickets on sale daily May 15th to September 30th, limited to return October 31st. Confer with local agent.

The territory covered by the Trans-Continental Passenger Assn. Pacific coast and other far western territory not otherwise covered by the above associations, suggest that the summer excursion rate \$72.50 is as low as can be granted from San Francisco to Chicago and return. Sale dates for tickets June 29-30th, and July 2-3rd.

Excursion tickets from Oregon and Washington to Chicago, daily during June and July.

Through tickets to New York via N. Y. Central R. R. permit stop-over of ten days at Rochester by depositing ticket at Station Ticket Office immediately upon arrival. A convenience to those joining the European Tour or visiting the Metropolis.

From N. Y. to Rochester—Excursion tickets sold—July 5-7th, return by July 13, via New York Central. Rate to Rochester—excursion both directions, \$14.45.

Via West Shore R. R. Rate to Rochester—excursion both directions, \$13.40.

Via Lehigh Valley R. R. Rate to Rochester—excursion both directions, \$13.40. For ten or more people, traveling on one ticket, \$13.20.

Your committee suggests that members confer with local railway agents with reference to excursion rates to Rochester or nearby points, with stopover privileges.

National Dental Association. Committee on Transportation. V. H. Jackson, New York, Chairman; H. F. Hoffman, Denver, Colo.; L. P. Dotterer, Charleston, S. C.; T. S. Smith, Palo Alto, Cal.; Wm. W. Belcher, Rochester, N. Y.



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THE PROS AND CONS OF THE THEORIES INVOLVED IN VACCINE THERAPY.*

BY H. H. SCHUHMANN, M. D., D. D. S., CHICAGO.

In discussing a subject which covers so many phases of interest and such a wide field of correlated matter, it is difficult, on account of the necessary time limit, to select that particular line of thought, which may be of the greatest interest to you, and while I shall endeavor to cover the topic, as a whole, fairly well, I shall at the same time try to lay sufficient stress on such salient points which I imagine will be of more interest to you in your particular avocation.

I realize that a paper of such deep scientific trend must naturally pre-suppose a great deal of knowledge pertaining to the fundamental principles and theories involved; however, I shall try to keep in mind that, while we are all familiar with the most important of these scientific theories, we are not specialists in physiological and biological laboratory work. I shall make an effort to point out to you the differences of opinion on some of the important questions which enter into the foundation, upon which men of scientific ability (those who have made this work their life task) have based their opinions with reference to the value of immunizing principles involved in the vaccine therapy.

While it is at once striking to note the vast difference of opinions of men who have written on the subject of immunity created by vaccines, it really is not at all surprising, if we consider the fact, that some of the fundamental ideas involved are in such a chaotic state and that men of great repute in this scientific research still have such diametrically opposite views

*Read before the Odontological Society of Chicago, April 1914.

on many of the activities and theories which have to be taken into consideration in pursuing the study of this subject.

To most of those, who have not made a thorough scientific investigation themselves and who have not spent much time on the literature covering these phenomena, this diversified opinion among our great scientists may appear unnatural, but to those who have followed the clinical and laboratory works on these matters and have thereby become enabled to realize the intricacies of some of the reactions, it will appear quite natural that there should be wide differences of opinion, and they will come to realize that the study of bacterines is not at all a simple matter. To understand it thoroughly much thought, study, clinical and laboratory work is essential.

The treatment by vaccine therapy means the creation of antibodies in the patient to combat the invasion of micro-organisms and their toxins into the system and while this may sound very simple, you will find as we go along that even this short definition carries with it such a number of unsatisfied questions, that we will find it impossible to go into all of them. In taking up the various phases of particular interest I shall, wherever possible, confine myself more closely to such organisms as are more frequently found in the oral cavity and adjacent tissues. The principles involved will be practically the same as those coming into play with regards to similar phases in the rest of the body.

In the first place we have to deal with germs. To one who makes himself busy in the laboratory this little word "germ" opens up a very large question. To procure these micro-organisms we must take them either from human beings or animals, transfer them to an artificial media and there stimulate their growth. At once the question arises are these germs when so transplanted still the same, considered from a chemical or physiological stand-point? Are these micro-organisms when taken for cultural purposes from the throat, tonsils or bronchi, after they have become mixed with the oral secretions, the same as originally found in the infected areas? Are these germs when examined at different periods, the same at all times? Are those found in different states of health of the patient always the

same? We find that while they are the same in name their degree of virulency and many of their chemical and physiological qualities are not at all alike under these various conditions, and in studying their activities in the laboratory, whether *in vitro* or *in vivo*, this great question of difference in their make-up as well as their activities must not be lost sight of and will naturally lead to results, which vary materially, both practically and theoretically.

You surely appreciate that it makes a vast difference if you have found as a remedy, an antibody, for a germ of a particular degree of virulency, that this same antibody may not at all be applicable to the destruction of the same germ if it is encountered not only in an entirely different state of virulency but with an entirely different coat of protection. Not only does the degree of virulency of the individual germ enter into the question of the amount of infection produced, but the concentration of the number of infective micro-organisms also plays an important part. If you will try to realize the marvelous reproductive powers of bacteria you will find that this question is not a small one. It is hard to believe that some of these organisms multiply themselves seven million fold in twenty-four hours and that a small concentration of a microbic colony of, say only one billion germs, can in the course of twenty-four hours reproduce itself in such numbers that the figures run into such a vastness as to make calculation almost impossible. Think also of the variance of toxæmia produced in germs through the admixture of animal secretions. In our effort to obtain them for cultural purposes this difference in the ultimate toxæmia of the artificially grown germ, as compared to those doing the actual damage in the living tissues, is most striking.

A pneumococcus, for instance, in a case of pneumonia coughed up and mixed with mucus and saliva of the mouth is very quickly changed into a germ of an entirely different activity and virulency by the action of the saliva, and a vaccine made from such a culture would have very little practical effect on the pneumococcus in the lung, which we are trying to combat. It is therefore most essential, before proceeding to the making of a vaccine, to be sure that the specimens obtained are as clean

and free from extraneous material as possible, and that in their transference to the culture media as little time as possible is wasted in order to prevent the admixture of such germs as may be floating in the atmosphere.

Even in those cases where it is possible to transfer a smear from an infected area without contamination to a propagating medium, we cannot feel at all certain that the result in the culture, will be anything like the one found in the original seat of the trouble, for the reason that many of these micro-organisms depend, for their biological reactions, on the influences brought to bear on their growth by other concomitant microbes, and while the real infectious germ from which we obtained the growth might develop there, it is frequently found that those surrounding and co-existing organisms necessary for its particular degree of strength and activity will either not grow in the artificial culture media or will multiply in far too great an extent, and in either case will change the activities of the newly cultured microbe. Theories based on experiments conducted on lines which admit of such vast irregularities in results, and differences of methods, must naturally result in many diversions of opinion. The question of adaptability to the favorable growth of a germ colony, as regards location in suitable tissue, and the variance in virulency and strength of such germs, brings to my mind an occasion upon which I was asked to assist in the capacity of an immunizer. It was at a time and place where there was an epidemic of pneumonia. I was called to see a patient, a woman in only fairly good health, generally speaking. I found there was a pneumococcus infection of the nasal and oral secretions. She and her physicians were much perturbed as to the likelihood of the production of a case of pneumonia as she was being constantly exposed to two cases of pneumonia in the same house. I explained to the physician that under the circumstances, fearing in a measure the negative phase which a vaccine injection would create, that the possibility of the development of a case of pneumonia would be too hazardous to undertake preventive treatment at that time and advised making a preliminary autogenous vaccine of the pneumococcus present, together with the pneumococcus from the other infected

cases, and to keep it on hand for instant use in case of need; also in that case to then make an autogenous vaccine from the patient herself, to be used in place of the preliminary vaccine, as soon as it can be made up. However, she did not develop pneumonia notwithstanding the fact that she was constantly exposed to infection and had a pneumococcus infection of the nose and throat. This shows that the question of selecting favorable *tissue location* for the activities of germs is a very important factor. There is evidently a great difference in the degree of immunity, due to the location in the tissues of the *host*. It is also a question if antibodies, which we might find possible to grow in a test tube, and which would destroy living germs in another similar planted test tube, would act in the same manner on the germs in living tissue.

Another factor of considerable importance which enters into the consideration of these matters is the influence of associated non-pathogenic organisms on the pathogenic germ in question. It has been clearly demonstrated that most infective germs are materially influenced in their biological behavior by the presence of other non-pathogenic organisms. Whether this influence, produced by these extraneous germs, is of the nature to change the reaction of the fluids which surround the pathogenic bacteria, or whether it is by influences which govern the development of the defensive means which these germs create, or other means, they *do* have a very decided influence, even though the *theory* of the cause and its results are not well established. It would seem that some of these *non-pathogenic* germs do not grow well on certain artificial media, and others, to the contrary, develop very rapidly, with the result that the *infective germ*, which is being cultivated at the same time for the purpose of producing a vaccine (with its own peculiar immunizing antibodies) do produce antibodies and antitoxins, but whether they would influence the germs in question, in the host, to the proper degree is uncertain, owing to the uncertain method of development of the germ used for production of the vaccine.—On the question of the *selective* action of antibodies there is also much difference of opinion. If the vaccines are *strictly speaking selective* in their activity, how can we reconcile these theories with

the fact, that vaccines produced in the above manner and derived from germs of different biological activities nevertheless show a decidedly beneficial action when introduced into the system? The theory that antibodies are able to take care of *closely allied* germs at times seems to be more or less substantiated by the fact that these vaccines do create proper antibodies.

The fact that the system may show various infected areas inhabited by the same class of germs in different states of virulency, and that still the introduction of a vaccine with antibodies for combating *one* certain strain of bacteria, does have a beneficial effect, does therefore *not* seem to be in controversy with the idea of some investigators, namely that these antibodies are *not absolutely selective* in their activities.

The more we look into these various theories covered by the above questions, the more perplexing and mixed they seem to become. It is fortunate that the investigators along these lines have progressed in a more or less empirical manner, and have shown us that while their theories of cause and effect may be at wide variance to each other, the main fact, that the introduction of dead sterilized bacteria *does* create certain reactions and does accomplish beneficial results, all of these men seem to agree upon.

Let me add here that, in the proper preparation of vaccine, the idea over which there has been some discussion and one which I have mentioned before, namely, the variance in the degree of virulency of the artificially grown germ, can be more or less controlled, and the toxic degree of the germ produced in the test tube can by the addition of animal extracts be increased to almost any desired extent. It has been shown, for instance, that the streptococcus germ can in this manner be brought up to such a degree of virulency that one single germ introduced into the peritoneum of a guinea-pig will prove to be a lethal dose (R. W. Allen).

A test for the purpose of determining whether the immunizing possibilities of a vaccine will actually be accomplished, can, if necessary, be shown (before it is used on the patient) by making what is known as a compliment fixation test or an agglutination test. This naturally applies to that variety of

germs which necessitate for their destruction in the human system, fixation of compliment or agglutination. A test of this kind may be needed if we are in doubt whether the class of germs selected for the making of an autogenous vaccine were wisely chosen or not. Another great question which has not as yet been satisfactorily solved is that it has not been determined whether certain of these germs produce their ill effects by the excretion of toxins, or by mechanical obstruction, or through the fact that they contain proteids, or by other means, nor has it been shown that the curative effects are identical if produced in vitro or in vivo; however, for all practical purposes it has been sufficiently demonstrated clinically, and in the laboratory, that the theories we have regarding the activities of bacteria with reference to their toxæmia and their method of invasion, are practically the same in vitro as in an animal.

The immunizing effect of the introduction of a vaccine is produced by the creation of antibodies and as the first of these defensive means, let us consider the theories advanced with reference to *antitoxins*.

In discussing this phase of the subject, it will be necessary for us for a moment to consider the toxins which micro-organisms contain; as you all know, there are exo and endo-toxins but aside from these, they are apt to excrete also other by-products which must be taken into consideration, such as hemolysins, cytolsins and leucolysins, in other words, those capable of destroying the hemoglobin of the blood, the tissue cells and the leucocytes. Such other excreta as chemical byproducts, namely acids and alkalis I merely want to mention. An example of the bacteria excreting hemolysins or having a hemolytic effect may be found in the streptococcus of a case of anemia, wherein it acts as a destructive agent to the red blood corpuscles. I do not want to enter into the subject of serum and its antagonistic effect against germs with enzymes such as those of the exotoxin group any more than is necessary, but as I shall try to cover the topic as nearly as possible in its entirety, I feel obliged to touch on these matters. The germs of diphtheria and tetanus are cited as examples of those belonging to the exotoxin group; that is, their ill effects are produced not by the actual

invasion of germs of their nature into the tissues or the blood stream, but by their ability whenever located in the tissues to excrete *toxins* that are absorbed into the blood stream. Naturally in our fight against *their* pathological influence on the host, it will be necessary to produce such a serum which will destroy these excreted toxic poisons (and possibly also the bacteria themselves).

Most micro-organisms contain endo-toxins which are not excreted. The toxins contained in them, only coming into activity, after the germ is broken up or is digested within the cell of the polymorphonuclearneutrophyles. Those writers favorably inclined to the vaccine theory believe that by the injection of dead bacteria (and therefore their endo-toxins as well) in suitable doses, and at proper intervals, that the anti-toxins produced thereby will ultimately and according to Ehrlich's chain theory or Metchnikoff's micro and macrocyte theory, destroy the toxins and germs together in the infected animal.

It would appear from this, that in the process of natural and unaided recovery from disease, the anti-toxins formed in the blood would necessarily play a considerable roll, and further, that the proper introduction of anti-toxins into the circulation would in all cases prove an infallible defensive measure against bacterial invasion and toxæmia.

Now let us consider these two points for a moment. That the anti-toxins in the blood do *not* always play such an important part in the process of recovery from such a disease as, for example, diphtheria, has been shown from blood examinations made at various times during an attack of the disease, the results of such examinations showing that no diphtheria anti-toxins were present at all. There is no doubt that the diphtherial germ produces toxin, also there is no question that these toxins destroy the leucocytes, but in *those* cases, where no anti-toxin was found in the blood, the probabilities are, that this anti-toxic effect was consummated in the liver or spleen before the diphtherial toxin ever got into the blood stream proper.

In many infectious cases however, whether due to endo or exotoxic germs, no doubt the production of these anti-toxins in the blood *is* of considerable importance, and is probably pro-

duced by the efforts of such cells as polymorphonuclearneutrophyles and also by the endothelial and epithelial tissue cells.

It would be expected from the foregoing that in most cases of toxaemias the introduction of suitable antibodies from without would be beneficial and that the formation of antibodies in the blood, whether by artificial means or natural, should logically be expected to be ever present as a means of cure. But this is a question over which there is much doubt and conjecture. In the first place we do not know if anti-toxins produced by artificial means can be created in the blood stream sufficiently rapid to be of use, nor whether they be the cause of the recovery we find. Nor do we know for certain whether the anti-toxins found in the blood are really produced there by our *artificial* means or are only a *natural* method of the body to immunize itself against the invasion of pathogenic germs. Also the method of function of the antitoxins in the blood in infectious disease is not as clear as some of the men who have made investigations of these matters would seem to believe.

The next step to be considered in the production of immunity is the Widal phenomena or the *agglutination* of motile micro-organisms and while the agglutination act has been definitely proven, many theories with regards to these reactions are involved which are quite debatable; the fact has also been demonstrated, that even after agglutination, the germs in question are still capable of reproduction. It has also been shown that the act of lysing in the blood which belongs to the phenomena taking place in immunization, as we shall see later, can be shown to be almost *prevented* by the bunching up of the germs during this manifestation of agglutination; however, according to Allen the reaction of agglutination is explained in a way which would reasonably seem to account for the possibility of this lysis action to still take place, but outside of the blood stream, his belief being that the very fact of the germs being bunched together causes them the more easily to be caught in the tissues of the liver and spleen where they will be readily acted upon, as these are the very organs where the immunizing and consequently lysing bodies are principally formed.

In the consideration of *lysins* which is the next step to be

thought of in immunization, there is much controversy as to the source of the compliment or cytase which is needed to produce lysing. The probability is that it comes from the polymorphonuclearneutrophyles. Various theories pro and con are cited on this question; the main point, however, is that it is universally admitted that compliment fixation *does* exist and is a great factor in the phenomena of immunization; the same is true of Ehrlich's theories of Amboceptor or Metchnikoff's fixator. The manner in which various vaccines and serums produce curative results is often unknown, for instance, germs against which no lysic action is produced in the process of immunization one, which I want to mention, is of particular interest to you dentists, namely the staphylococcus class. No lysin in the serum has been found for these. Serums such as those used to combat streptococcus infections seem to explode all our theories. We do know that the proper introduction of vaccines and serum to act against streptococci *do act*, and this has been definitely proven, in animals as well as in man, and in the laboratory in vitro but the theories of *how* the action is brought about are in utter chaos.

It seems that through all of the controversies, this end result that immunizing serum *does* produce curative and beneficial results is admitted. The theories and the *manner* in which the cure is brought about are in some instances much mixed.

So far the factors which we have considered in immunization, namely antitoxins, agglutinines and lysins, we find that many writers believe that their actions are partly produced by the efforts of the phagocytes, the phagocytes themselves not entering into the reaction. We should now consider the force or substance which causes the phagocytes to produce these immunizing bodies and which are supposed to be the opsonins. Here again we find the scientific minds to be much at variance, Metchnikoff claiming the opsonins to be merely the stimulating force acting on the white blood cells, while Wright claims that these opsonins are actually existing bodies in the blood, which have a definite affinity for the bacteria (and their toxins) and that they do not effect the leucocytes at all. Both writers agree to the need of presence of opsonins so we find here again

the theories are conflicting, but the beneficial results are nevertheless admitted by both.

The processes connected with those of phagocytosis and those connected with the theories of similar activities of the epithelial and endothelial cells of the tissues with their influences regarding immunity cover a subject fully as large and as interesting as the matters referred to above, but I feel it would be useless to increase the length of this paper at this time by including in it a description of these phenomena and the various theories involved therein. At some future time, if I may be permitted, I shall be glad to give you a summary of these interesting ideas.

I might mention here briefly that the importance of phagocytic action of the polymorphonuclearneutrophyles is hardly less important in the creation of immunity against various infectious diseases or in the re-establishment of health during such a disease than are the different phenomena mentioned before. Vaughan in one of his splendid papers goes into the study of the activities of these blood corpuscles very fully and speaks of their action in cases of pneumonia infections particularly explicitly. The degree, (may I say), of leukocytosis has since then been taken as an almost infallible prognostic sign by the average medical practitioner. A hyperleukocytosis meaning a favorable prognosis and a hypoleukocytosis a bad omen.

It would seem after studying the various matters we have gone over that what we most need to work for and ultimately find out is *what* it is which is added to or withdrawn from the bacteria, or from the surrounding tissues and fluids, to cause the bacteria to change in virulency. Why a dormant pneumococcus today should be virulent and pathogenic tomorrow? We know some of the *general* causes on which these changes may depend but nothing definite is known regarding the actual chemical change which brings about this reversal of form. Perhaps when we are able to determine the actual chemical makeup of opsonins, if there are such things in fact, we may be able to arrive at some very valuable conclusions.

After having heard the pros and cons thus far with reference to the vaccine therapy and particularly with the theories refer-

ring to the production of immunity, the *fact*, that the various scientists who have created these theories do seem to agree on the main principles and find that the judicious use of vaccines and anti-toxins are of considerable benefit, should give us the right and the stimulus to make efforts to substantiate and if possible analyze and improve these beliefs by using them clinically even though we must admit that some of the ideas involved are at least at times based on practices of an empirical nature.

I believe that in the citation of a few cases recently under my observation I may be able to show you that these beneficial effects do occur.

Before so doing may I be permitted to make a plea to you, gentlemen, to advocate the desirability for scientific research work among the ranks of our profession? Too few seem to be sufficiently interested, and it does appear a pity that men, who have had the advantages of an education along scientific lines equal to those of our medical friends, should display lethargy in the practice of their profession along more scientific lines, seemingly to lean more towards the paths of mechanical efforts and mechanical work. I would not wish to be understood, by any means, to belittle our well known efforts along the latter lines, as I fully realize, we have very great need of them and I realize thoroughly the beneficial effects produced by them, but I do feel certain that without the introduction of profound scientific study and development in research work we shall soon approach the danger mark of being superseded in our reputations as the leaders of our profession by our confreres across the water, who have the desirability of doing all their work along truly scientific methods, instilled into them from childhood. At present they may not display the degree of manipulative ability of which, we in the United States pride ourselves, but I fear their superior qualifications to do real scientific work and their inborn and cultured taste for it will, before long, crown them with the glory of having achieved work and reputations in scientific circles, much to be envied by us, who are inclined to lean toward the more practical and visible mechanical side of our work. With reference, in general, to the cases of which I am about to speak to you, I want to emphasize the absolute necessity of dentists to

work in conjunction with the family physician whenever and wherever he finds that general conditions are not up to their normal standard, in other words, where the suspicion exists that oral infectious foci are present, I deem it advisable for the dentist, if he be able, to make a complete urinary and blood analysis. Although it may not be within the scope of this paper to say very much about these matters, I feel that it is sufficiently important to emphasize the need of such analysis wherever infectious foci are suspected and the importance of the utmost accuracy in making them. I must reiterate this to impress it thoroughly on the minds of all those who contemplate to engage themselves in this line of work. I speak of blood analysis and when I do, I do not mean a superficial blood count but a very thorough numerical and differential count, most exact in every way, from the taking of the specimen to the ultimate report of the finding. The same with reference to urinary analysis, a superficial test for sugar and albumin is entirely inadequate and the research must be most complete, chemically and microscopically and of a full twenty-four hour specimen. I do not know how familiar you gentlemen are with this line of work but sufficient stress on the need of accuracy, patience, knowledge and minute care can hardly be stated. Tests for *all* abnormal ingredients should be made and some of these, those for instance referable to the reduction bodies, should be repeated by three or four different methods, particularly if reduction bodies are found, so as to be able to lead you to definite correct conclusions. You must realize, gentlemen, that in making these examinations you are not working on patients (at least in most instances you are not) who have drawn your attention through a citation of symptomatology to the probability of systemic troubles or to suspected pathogenic findings, so you must realize that in simply trying to find *slight* deficiencies in the various organs requires extra great care and minute work. *Your* findings as dentists will, if at all pathogenic, usually only be slight that is merely a slight abnormality and if you do find that, you will assist in preventing serious results later on. Conclusions should not be drawn haphazard but only after painstaking careful research and the use of urinary co-efficients, based on a thorough understanding of the subject, which must be at your com-

mand, in order to lead you to correct deductions. Should abnormalities of any kind *be* found, which would be seen by you long before the patient has the need of consulting a physician on account of symptoms suggesting an abnormal condition, then in such cases, it is your duty, not to alarm the patient, but to confer in an ethical and scientific manner with the family physician and seek his assistance in your work for the benefit of the patient. The advisability of practicing the actual vaccine treatment yourself or delegating it to someone else, I must leave to your best judgment.

While I do not think that the use of autogenous vaccines in your line of work is connected with the probability of great danger, it nevertheless means the introduction into the system of very active principles and should therefore never be used by anyone, either physician or dentist, without his being thoroughly familiar with the theoretical and clinical observations made up-to-date in this line. Whether I have been particularly fortunate in the fact to have found the proper seat of bacteria which was selected for the preparations of the vaccines used or not is hard to tell, but in cases in which I have used this method, patients have been universally much benefited. Great care is needed in determining the fact whether the proper bacteria from the correct location are taken to produce the immunizing fluids. There may many times be oral foci present in conjunction with other disease manifestations but it does by no means always follow that the oral foci or the bacteria found there were really the active causes of the pathological conditions elsewhere. Therefore care is needed in order to be successful to determine the proper cause productive of these various bodily disorders.

In the following cases oral foci were determined to be the cause of trouble and it is from the oral cavity that the cultures were made. A case of interest to you may be that of Mr. J. brought to me December, 1913. The patient at that time exhibited a fistula through the hard and soft tissues over the left upper central incisor which upon digital and X-Ray examination proved to be a split root. He was also suffering from a dento alveolitis (Pyhorrea) on a number of teeth and soreness to percussion of the upper left second molar, to which was attached one end of a three-tooth bridge by means of a large gold inlay. The root in the

front of the mouth was extracted, cultures taken from the deep parts of the fistula also from a number of pockets around the teeth and a vaccine produced containing staphylococcus, pneumococcus in chains with a small amount of streptococcus. He had a severe rheumatic condition in his left shoulder, elbow and hand with pronounced swelling of the joints of the three fingers with extreme sensitiveness to the slightest touch to them and inability to move them. Patient was put on a strict simple diet with instructions to partake of at least eight or ten glasses of pure water daily. A costive condition for which purgative had been used for many months was remedied by the addition to the diet of three tablespoonfuls of pure olive oil daily and a raw apple at night followed by a glass of water. The vaccines were given practically every fifth day, the dose being gradually raised from fifty million to one billion six hundred million. The patient was under observation from December, 1913, to March, 1914, and when last seen was very comfortable. The progress of the case was as follows:—Very slight local reactions were obtained from the vaccines until doses of six to eight hundred million were arrived at. From thereon the local reactions were typical. The rheumatic conditions did not improve in the least until such time as the doses reached the eight hundred million mark and up to that time the patient was much discouraged and almost tempted to give up treatment, but at that period a very sudden change for the better occurred and when I last saw him the fingers of the hand were perfectly movable, no pain whatever no matter how hard the hand was squeezed and all pains in the joints of the elbow and shoulder had gone. Slight digressions from diet did not seem to make any appreciable difference in the symptoms. The bowel condition had been almost immediately corrected by the above prescribed oil. This case in a measure illustrates one of the much discussed problems of immunity to pathogenic germs, that is, that in *chronic* conditions it very frequently requires the accumulated effects of repeated introductions of vaccines before the scale of immune bodies and that of the disease producing germs seem to become balanced (graphically of course) and from that time on a further increase in dosage and continued use shows marked beneficial results. *Acute* infections usually respond at

once to treatment. In this case the swelling in the joints will probably be permanent or at least be reduced very gradually. The oral conditions are entirely cleared up and I wish to call your attention to one point especially. You remember that I mentioned the upper left molar was sore and sensitive to percussion, due I think to the fact that it may contain a dead pulp. Well, at the present time it is not at all sensitive nor does it make any response to percussion! Unfortunately the work involved in opening it and the making of a more extensive bridge is not permissible at this time owing to the prospective early departure of the patient from this country to Europe and I regret that this possible source of infection must be left until his return from abroad.

Another case which may be of interest is that of a man thirty-eight years old residing in Northern Michigan. The case is interesting both from a dental and medical standpoint. He came to me in November, 1913. The principal point of interest in the medical diagnosis was an enlarged condition of the liver, extending two finger breadths below the intercostal line. Also he had a marked yellow discoloration of his eyes. The teeth were so loose and exhibited such pockets that I immediately extracted three and advised him to have all the others removed as soon as possible. From a dental standpoint the case was hopeless. But, as he insisted on my using whatever means I had, to at least try to save what teeth I could, I made what I thought would be a useless effort. The pockets about his teeth were very deep and large and did not contain any visible pus. Cultures taken from them showed staphylococcus aureus, streptococcus pyogenicus and a predominating pneumococcus. An autogenous vaccine was prepared, the teeth scaled and cleaned and the pockets washed out as best I could in one sitting, and that night the patient left for his home. The vaccine was sent to his physician with complete directions how to use it and I did not see the case again for two months. I was astonished when the man presented himself again to find his eyes clear and his oral conditions so wonderfully improved that I shall now make every effort to save his teeth and I am quite sure that I shall be able to do so. I was much interested to know whether the vaccine had had any influence on his enlarged liver

and for that purpose wrote his physician and his answer was, "I find this man's liver perfectly normal."

Another interesting case of April, 1913, was that of a man of this city with interstitial nephritis, typical urine with a negative blood analysis, a slight endo carditis and high blood pressure. He was put on a strict diet, relieved himself as much as possible from business cares, submitted to proper dental treatment and received autogenous vaccine injections for a period of two months. His blood pressure was reduced to almost normal, there are no casts or albumin in his urine and the dento alveolitis is at the present time completely cleared up. The case reminds me of one of the difficulties which you also may sometimes encounter, when the assistance of the family physician is unwillingly given. This has occurred to me in very rare instances and I find that each time that it happened it was due to the fact, that the physicians in charge were not familiar with the scientific work in these lines and therefore did not grasp the situation as clearly as they should. I mention this incident because of an argument made by the doctor in this case and which may be of interest to you. The question which arose and caused the hesitancy on the part of the physician was one over the possibility of the production of anaphylaxis. I explained to him that anaphylaxis is usually regarded synonymous with serum sickness. The vaccine not being a serum, there is of course no serum sickness to be feared. It is, of course, recognized that bacterial proteins or animal albumins may give rise to mild reactions in man if introduced into the system as by the use of vaccine such as does the tuberculin reaction (Von Pirquet) which is considered an anaphylactic reaction, but this has nothing to do with serum sickness and I nor any of my colleagues, who have done vastly more work in this line than I have, have ever heard of anything which anyone could refer to as an anaphylactic reaction from the administration of vaccines. Nor has anyone else ever reported any such observation. To the contrary, there is an establishment of tolerance to whatever toxicity there is in vaccine by its repeated administration rather than anaphylaxis, which is just the opposite of the same.

I could detain you for many hours to further describe numerous cases, but do not wish to tax your patience any longer. It is

admitted by all those who have become interested in this work that the vaccine treatment is most beneficial and practically harmless when carried out in a correct manner along scientific lines and by men thoroughly capable of understanding all the clinical findings and all the symptoms involved. Personally I am well satisfied with the results I have obtained and I feel it warrants me to continue the vaccine treatment in conjunction with such local work as may be necessary in the treatment of infectious oral foci. I am by no means an enthusiast over the vaccine therapy but I firmly believe that the results so far obtained more than warrant the continuance of my practice therein and particularly have stimulated *me* as I hope it will *others* to continue in scientific research work which will redound to the ultimate benefit of the investigator as well as of that of his clientele.

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PYORRHEA AND BRIDGE WORK 2,500 YEARS OLD.

BY L. P. HASKELL, D. D. S., CHICAGO

The illustration presented is of a specimen of ancient dentistry, taken from an Etruscan tomb, and dating back 600 years before Christ.



Ancient dentistry—2500 years old.

It shows teeth having dropped out of the gums, evidently from this usually supposed modern disease pyorrhea and replaced practically by what is now considered one of the late inventions of modern dentistry. Gold bands fitted to each tooth and soldered

together. This was owned by Dr. Barrett of Buffalo and is now in the Dental College of Buffalo.

This case has already been illustrated years ago, but it is thought that there are many young men entering the profession who have never seen it, and who would be interested in it.

UTILIZATION OF DIATORIC TEETH AS INTERCHANGEABLE TEETH FOR BRIDGES.

BY DR. S. SATORI, URUGUAY, SOUTH AMERICA.

(Translation kindly made by Dr. E. M. S. Fernandez, Chicago.)

We take a molar and widen its natural orifice with a cylindrical shaped stone burr. An impression is then taken of the inner portion with inlay wax. The cast is next poured and we obtain our piece for the bridge. (Fig. 1.)

The utility of this work lies in the fact that the practitioner is not always able to obtain interchangeable teeth in the dental depots. The results are very satisfactory, as has been proven by many years experience.

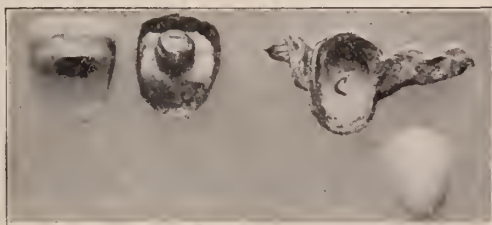


Fig. 1.

Fig. 2.

Figure 2 shows a small bridge composed of two inlays, which serve as supports for the replacement of the second bicuspid. To do this inlays are modeled in the mouth with hard wax, having a small protuberance of wax on each depression. A plaster impression is then taken and the model is poured with casting investment, the facing is then adjusted and smeared with vaseline, and the lingual and occlusal surface carved in wax to the bicuspid form. We now have our bridge modeled in wax. The facing is

next taken off and with a spoon-shaped excavator the wax is removed from the inner side of the crown. (C) We now have the inlays in position; the hollow crown is trimmed to the model as accurately as possible and is cast. The facing is attached with cement, which fills the whole crown, and we thus get a bridge



Fig. 3.

which combines the essential qualities of lightness and strength, as well as of easy replacement in case of fracture of the tooth. When grinding the facing it is well to bevel it all the way round, in order that the gold may fit accurately.

Figure 3 is a bridge cast in one piece, using the two kinds of teeth mentioned in the former pieces, the lateral and the first



Fig. 4.

bicuspid with facings, and the second bicuspid with a diatoric. This bridge has been modeled in hard wax on an impression taken in the mouth. The impression is coated with vaseline.

Figure 4: Upper plate cast for porcelain gum (Continuous Gum Work). It is all cast at one time, and with one point of entrance for the gold ($3/23$ of an inch in diameter) between the two central teeth (a). The technique is not difficult. The teeth are set up for a vulcanite plate. Plaster is then applied to the outer portion of the model, so that when the wax is removed the teeth remain in position; this covering of plaster is cut in three places in order to facilitate the removal of the teeth from the cast. A little pink wax is then placed on each tooth just



Fig. 5.

covering the pins and giving the wax a cone-shaped form. The teeth are next placed on the model, and plaster is poured on as in Fig. 5. We now have all the teeth in position, and held firmly by the new plaster on the lingual side through the small wax cones. We have our model free of wax and with the teeth in position. The plaster we had poured on the outer side of the cast is no longer needed as the teeth are firmly fixed in position.

We then place the wax for casting. This operation is done in two stages: 1st. We place the wax corresponding to the palatal arch extending it to a line corresponding to the plan of plate. It is necessary to scrape the plaster which holds the teeth in posi-

tion all along the palatal arch, which is covered by the casting wax.

We now place the teeth in position and pour fine investment over the plan of plate down to the gingival margin. As soon as the investment hardens it is cut down to leave room for the porcelain. A thin sheet of casting wax is now placed over this investment and trimmed to the teeth. By means of a hot spatula the edges of this sheet of wax are united to the margin of the wax already placed over the palatine arch and which reaches to the line of the plan of plate, as already mentioned. We thus have a layer of investment between the two sheets of wax. The plaster is now removed with the teeth and we are ready to cast our plate.

The resulting plate for continuous gum is quite light, as the portion corresponding to the gum is hollow (Fig. 4).

The work must be done with pure gold, and low fusing porcelain which fuses at a temperature that the gold will withstand. The gold corresponding to the palatine arch is afterward reinforced.

No solder has been used in any of the work presented in these illustrations.

HOW TO KEEP WELL.

BY H. E. BLILER, D. D. S., CHICAGO, ILL.

The credulous are prone to credit their misfortune and distressing ailments to the irony of fate, instead of placing the blame on their own ignorance and credulity, where it rightfully belongs. We, having been endowed with a mentality for our preservation it depends largely on our alertness and observation of basic principles to give adequate protection from disaster.

The best immunity from physical disease is pure blood (the sap of life). What does pyorrhea alveolaris, with its eighteen technical names coined by brain storm enthusiasts indicate? Pus exuding from the gums. Carbuncle (boils) pus exuding from the neck, usually. Appendicitis, pus exuding from the appendix, the breaking down of cellular tissue, due to toxic gases and toxemas from the gastro-intestinal tract, putrefactive changes, the waste

not being eliminated through the proper channels. Clinical experience verify that regular elimination, youth and exercise, are not adequate to throw off all toxic effete matter, as is clearly indicated in Cases 1 and 2 appended, being rare and acute cases, apparently normal in every way.

Some contributors who have a rage for writing, in their frantic efforts to conserve the specialist, maintain that many of our ills come from mal-occlusion (irregularities) and that the anatomical articulation, Gysi method, will save and preserve the entire human race. As a matter of fact, the method upholds the wholesale destruction of natural teeth, so a full denture can be worn and an anatomical articulation obtained. I maintain that every natural tooth should be saved and there are few cases where they can not be, such as abscessed teeth where necrosis exists, They can be saved many times by trephining, but an exostosis extraction is indicated.

Efficient crown, inlay and bridge work are the nearest duplicates to nature that can be had, as you have the strength of the natural teeth and roots, the contour of the face being preserved. By the destruction of partial dentures of natural teeth, there is nothing left to do but wear full dentures and where it is absolutely necessary the anatomical articulation is the next best thing.

As to mal-occlusion would say, thorough mastication is essential. The amount of food eaten is the point that is important. Excesses of food if ground into a pulp will add fat deleterious to true vigor and cause systemic stagnation, with resulting disaster enumerated. Irregular teeth should be straightened and proper extraction will assist many times and should be done where the patient has not the time and money to spend for a long course of treatment.

The specialist rarely experiments on himself. I have a patient who had 606 shot into him for venereal taint, but he never showed a trace of syphilis in his life. Has treated two years and getting worse. Another has had treatment for sixteen years, the only ailment he had was auto-intoxication, systemic stagnation.

I have not the time or space to elaborate. What we need most is immunity from erroneous conceptions and predatory commercialism.

DIET PREVENTION.

Eat moderately, and of boiled or stewed meat sparingly—once daily. Preferably vegetables and fruit diets—such as rice, the corn products, pineapple, apple sauce, prunes, oat meal, cereals, whole wheat, and wheat bran occasionally, etc., avoiding pastries. Do we live to eat, or eat to live? The point that is important.

TREATMENT

When any morbid symptoms appear, cleanse the gastro-intestinal tract, taking internally a large dose of castor oil, followed by a vegetable cathartic, nightly for a fortnight, gradually diminishing doses. Olive or mineral oil will assist, twice weekly. Repeat above treatment quarterly and you will retain normal conditions, with good complexion and sweet breath. Many people rust out their vital organs instead of wearing them out.

Cases which illustrate and verify my contentions.

Case 1—Mr. W. L. S. twenty-two years of age. The acute systemic attack of phagendemic pyorrhea was a veritable *fire*, with a large pus pocket at angle of the jaw. I cauterized with H. C/L. H_2SO_4 , healing it. But the same conditon would appear at the opposite angle, and would keep shifting back and forth like a smouldering fire. The teeth were all loose. There was no history of venereal trouble nor of any drug taking. No signs of any other disease were present. I gave him the usual local treatment with no avail. Antiseptics seemed of no benefit. After treating him for two months, I decided that I had here a systemic basis. I placed him on a tonic eliminative treatment, with the result that in less than ten days all the former trouble had disappeared.

Case 2—Miss S. M. B., Vandalia, Mo., age 30, chronic case of fetid breath; biliousness of long standing, causing severe headache; sallow complexion, lost one molar from pyorrhea and had been troubled for years with it. Many pyorrhea patients have previously lost their appendix, you will find on inquiry.

In most all diseases a thorough treatment is instituted, but with autointoxication (constipation) it is different. In nearly all cases a single dose is administered, instead of taking an efficient course of elimination, for a fortnight, and giving constant atten-

tion, for the ailment is always present from a mild form to complications.

Disaster, like in the appended cases, could have been averted by adherence to the simple rules that underly health (eliminative treatment).

(By the Associated Press)

Los Angeles, Cal., March 8.—(Special)

"Three more of the eight men who were given New Salvarsan on Saturday at the county hospital died today, making seven victims within twenty-four hours. The eighth man is not expected to live.

"The fatal results from the toxin, which is in worldwide use, had baffled the medical staff at the hospital and caused consternation among the physicians of the city, many of whom have been giving the treatment.

"Physicians here believe the alarming result from the use of the treatment at the county hospital will attract world-wide attention of the medical profession."

The reflex action and results from the unwarranted use of the knife, serums, and antitoxins are speculative. By the use of nature's simple remedies, sanely stimulating all excretory organs with diet prevention for the cure of disease, the results are positive, and assuring.

The tendency of the times, is to elaborate and exaggerate, on simplicity, as it serves commercialism best. After wonderful research work a new malady has been discovered. It applies mostly to sluggishness (systemic stagnation) in the south and is termed the "Hook Worm," I traveled thirty-five hundred miles recently, south of the Mason and Dixon Line and all I got was the "hook."

At a meeting of the Chicago Dental Society last winter Dr. Chas M. Mayo of the eminent Mayo brothers, made the statement that "The next great step in medical progress in the line of preventive medicine should be made by the dentists," and added the question, "Will they do it?"

Much credit is due the Pharmaceutical Companies for their efficient aid and furtherance of prophylaxis, by their generous supply of literature and samples of meritorious products, spelling redress to many.

PROCEEDINGS OF SOCIETIES.

ODONTOLOGICAL SOCIETY OF CHICAGO.

A regular meeting of the Odontological Society of Chicago was held on Tuesday evening, April 7, 1914, at 8 P. M., at 12 South Michigan Avenue.

The President of the Society, Dr. L. L. Davis, occupied the Chair.

Dr. H. H. Schuhmann presented a paper on "The Pros and Cons of the Theory Involved in Vaccine Therapy."

DISCUSSION.

DR. JOS. L. MILLER:

I wish to express my appreciation of this privilege. We are convinced that many of our cases of rheumatism originate from pyorrhea, and we feel that we can only handle these cases when the dentist is able to handle the source of the infection. This question of immunity is as old as the question of bacteriology. From the time when we found out that bacteria were responsible for disease immediately there developed a study as to why an individual who had had one attack should be for a certain period of time or for life immune against that same disease. It was soon determined that when an individual has an infection like scarlet fever there is developed a substance which not only terminates the disease, but remains in the body and renders the individual immune. It is true that immunity is different in different diseases. In some diseases the period of immunity may be very short. If it were not for the development in the body of such an immune substance there is no reason why a person having measles should not have measles for the rest of his life. With the development of this phase of the subject experiments were made with a view to producing artificial immunity without having to go through the disease. One of the first things thought of was for the individual to be inoculated from a person having a mild attack. It was thought this might give him a mild attack and render him immune. That method was used in small-pox; however it was soon found that this was a dangerous procedure, be-

cause the second individual might have a severe attack. Upon this basis rests Friedmann's cure with the turtle bacillus, which produces a mild type of the disease. The danger is that we do not know what may happen to the germ when it gets into a different host. It was found that the safer way was to inject a certain amount of the dead germs. So we have our series of immunizations against disease; in the lower animals against hog cholera, anthrax and so on, and in man against small-pox, Asiatic cholera and typhoid fever. In all, the process is the same, injecting a certain amount of dead germs and producing this protective substance in exactly the same way as the individual would develop it with the disease. It was not until Wright's time that the use of these dead micro-organisms was considered valuable in the treatment of disease. It was Wright who called attention to this point, that in certain forms of localized and chronic low-grade infections the injection of dead germs might do good for this reason, that the germs present do not produce sufficient amount of toxic substances to excite the formation of immune bodies; that if we could introduce into such a person a large dose of dead germs we could hasten the immunizing process and bring about a cure. In very acute infections the individual is already so filled with poison from the germ that the immunization excitant is already present.

A study of pyorrhea offers some unusual difficulties. The first difficulty is in determining the germ that is really responsible for it. If a man has a crop of boils it is easy to obtain some of the pus and examine it and find out exactly what is causing the trouble. In pyorrhea it is very different because such a variety of germs are in the mouth, and as I understand it they have definitely decided what germ is responsible for the condition. As I understand it, the method of procedure has been to cleanse the mouth as thoroughly as possible, especially about the tooth where you expect to get your culture, and then by introducing a sterilized wire down along the tooth get the predominant colony present. If you want to make a mixed vaccine you can select the second most frequent colony found there.

Another question arises here, as to whether, having cured this condition, such cures are going to be permanent. We know very

well that the period of immunity acquired from pyogenic infection is a short one. Just a word in regard to the stock vaccines and the autogenous vaccines. It seems at the present time that the use of vaccines can be almost classified as a fad. I think this has been very largely due to the drug-houses who have developed all sorts of vaccines to cure all sorts of conditions. It seems to me the way to treat these patients is by the autogenous vaccine. While the same condition may exist in several individuals the exact strain of micro-organisms causing it may differ somewhat.

Another question comes up as to whether we can do harm with these vaccines. I think without doubt harm can be done. We see that not infrequently, for instance, in the treatment of rheumatism. There the patient undoubtedly grows much worse when you get up to large doses. We overwhelm the individual with poison, so that his resistance is lowered. I feel that our dosage must be very carefully regulated. In all our vaccine therapy we never intend that it shall take the place of good drainage. If a person has bad tonsils, and rheumatism from that source, we do not intend to treat the rheumatism until we have removed the tonsils. If we do not remove the source it is only a short time before the patient will have another attack.

It would seem to me that in pyorrhea there ought to be an excellent field for the use of vaccines, and you have one great advantage, that you can see with your eye what is going on. You are dealing with a chronic disease that has not been as yet cured, and it must be perfectly apparent to you when the patient is cured.

DR. A. F. JAMES:

Mr. President, a question arises in my mind as to whether it is advisable to use the vaccine therapy in cases of pyorrhea, unless there is a general systemic toxemia. I would like to cite just one case of a patient who came to me from a nearby city. She had consulted a dentist whom we all know. He has been giving a great deal of attention to the vaccine treatment, and made a culture for her case. The patient became frightened and came on here for consultation. Upon examination I found dead pulps in the two upper second molars. The opening of the teeth immediately cleared up the difficulty. There was no apparent systemic toxemia, and I con-

sider that in that case it would have been a mistake to use the vaccine treatment.

Dr. Miller spoke of securing the germ for culture, without other bacterial contamination. The method I have followed is to thoroughly cleanse the tissues, pack well with cotton rolls, and paint with iodine. While still holding the extracted tooth in the forceps, remove the end of the root with excising forceps, and drop into a sterile test-tube, ready for the serum laboratory.

Dr. Schuhmann and several of us have been at work trying to get some knowledge of this subject. Personally, I do not feel competent to do the work. Dr. Schuhmann has gone into the matter far more deeply than the average man.

DR. C. N. JOHNSON:

Mr. President, I do want to express my appreciation to Dr. Schuhmann for coming here and giving us this paper. I believe I will receive a great deal of profit from studying the paper.

I would like Dr. Miller to know that his discussion is the clearest statement of the philosophy of vaccines I have ever heard in my experience, and I have read a great deal of literature on the subject. I would like to express to Dr. Miller my keenest appreciation. I am looking forward to the publication of this paper and Dr. Miller's discussion with a great deal of pleasure.

DR. P. J. KESTER:

Mr. President, I think I have read sufficiently on the subject discussed here, so that I could intelligently follow the paper of Dr. Schuhmann. It strikes me that the paper was not so scientific, but that the average dentist of intelligence could follow it, and especially if he has studied the subject of immunity. I think Dr. Schuhmann is on the right track, but I do not believe that a dentist or physician has any right to accept a theory that he knows nothing about. For instance, a man who makes the mere statement that an autogenous vaccine is good for a certain condition is not talking in an understanding manner.

If Dr. Schuhmann can direct the attention of the dentists to this subject, and get them to study it, then I think we will be gradually approaching the time when it will be proper for the dentists to recommend autogenous vaccines.

I was especially delighted with the plain talk of Dr. Miller. Surely, we could all understand him. So I say, let us thank Dr. Schumann and Dr. Miller for the good they have accomplished.

DR. J. E. HINKINS:

Mr. President, this is a subject of very great importance to me, and I was very much gratified when I heard that Dr. Schuhmann was going to read this paper. I enjoyed the paper, and the discussion by Dr. Miller.

This subject of vaccine therapy baffles me considerably. The treatment by vaccine therapy means the creations of antibodies in the patient to combat the invasion of micro-organisms and their toxins into the system. It is a well-known fact that most micro-organisms contain endotoxins which are not excreted. The toxins contained in them only come into activity after the germ is broken up, or is digested within the cell of the polymorphonuclear neutrophils. These ideas seem to be harmonious with Ehrlich's chain theory of ambceptor or Metchnikoff's fixator.

I was looking through Dr. W. D. Miller's work last night, and I think he classifies 125 different bacilli of the mouth. To select an autogenous vaccine from this number you would have to be a good guesser. To be honest, I have been able to arrest the disease, but not cure it; so far, the only cure I know for pyorrhea is the extraction of the tooth.

The paper and the discussion of Dr. J. L. Miller will be accepted by conservative men, and men who think as a classic for some time to come. After Dr. J. L. Miller got up and expressed himself so beautifully I cannot add anything more.

DR. J. H. WOOLLEY:

Mr. President, this question of therapy is a puzzling one to me. I do not suppose that Dr. Schuhmann, in his discussion, intended to confine himself to pyorrhea alone. About forty years ago I was living in a little country town, and people suffered with their teeth without the knowledge we have at the present time with regard to the saving of teeth. They would come to the dentist, suffering with various conditions. The teeth were removed and the vast majority of those people were restored to health.

DR. KESTER:

Were the people who had rheumatism cured?

DR. WOOLLEY:

I will except that. Now I have no doubt there are gentlemen in this room who have had patients who have been troubled with various diseases, and they have treated those conditions and restored the patients to health. The question in my mind is why there should be need of inoculation. I do not mean to discourage the research work of such men as Dr. Schuhmann. It may in time reveal to us something that is a universal panacea.

DR. S. J. KNOWLES:

Mr. President, there is a thought that comes to me with regard to using this treatment. I feel that there is great need of the work being inaugurated by the National Dental Society. We are told that there are certain places to use this treatment, and that there are certain dangers. It is my understanding in the treatment of liver disease, for instance, that calomel is going to increase the flow of the bile. You are putting poison there which ought to be taken out. Now the question is whether or not there may be some reaction after putting in eight or nine hundred million of dead bacteria. I think this question should be investigated, to know, if possible, what the result of putting these dead bacteria into the system may be.

The point that I have in mind is this, that in introducing these dead bacteria we may create some other disease. Here is a man putting something into the body of a patient, and he doesn't know what is going to happen. If we cannot treat pyorrhea along mechanical lines, I don't think that I am qualified to introduced a foreign body into the system. In the case of boils it has been beautifully brought out by Dr. Miller that they have a specific organism that can be obtained and we know what is going to happen. I have understood in introducing a vaccine they introduce a very small number first, to stimulate activity. First, there is a period of depression each time they introduce a large dose, and the depression does not go beyond a certain point. I think the use of these remedies is a dangerous thing for a young man, and I think a young man should be impressed with the fact that it is important to make a study of these things. When we first heard of the wireless telegraph we thought there could not be any such thing. Today we are finding out how practical it is. Tonight I say: Can we use such a thing as

this? Five years from now we may be using it. I think it is a good thing, but we must be careful.

DR. W. V-B. AMES:

Dr. Schuhmann's paper and Dr. Miller's discussion have been intensely interesting to me. I have in a desulutory way, as time admits, read some of Wright and Simon's works.

I am directly interested because the principles apply equally to infections of the lower animals. I wish to particularly recommend to any one wishing to get past the intricate vagueness of this subject to procure Simon's *Infection and Immunity*, in which the subject is led up to in such a way as to make it comparatively easy of understanding.

DR. L. L. DAVIS:

I am very proud to have had the privilege of listening to this paper. When I first saw a copy of the paper, and Dr. Schuhmann expressed himself as to the quality of an audience he would like I considered it a great compliment to this organization that he preferred it to hear the paper. I think this paper will go down in history. It is clear and concise, and in no other way could we have gotten the gist of what Dr. Schuhmann has given us tonight. The suggestion of Dr. Hinkins to have Dr. Miller discuss the paper was another fine idea.

I not only congratulate the society, but I congratulate myself on having had a chance to listen to this paper.

Dr. Hartzell is doing quite a good work along these lines, and Dr. Rosenow has done work along the medical line. There is no doubt but that they will get something out of their work later. It seems to me that vaccine is not indicated in all these cases. It is indicated where there is complete systemic disorganization. We have rheumatism and other troubles that may be benefited by the use of vaccines, but until this subject has been thoroughly studied they are not for general use.

DR. SCHUHMAN (closing the discussion):

It has been very gratifying to hear your kind words. It is just such encouragement that stimulates man to work. It is practically all we get out of it.

It was in 1840, about seventy-five years ago, that Dr. Hellroth first ascribed disease to microscopic invasion, and in 1892 that Dr.

Wright first advocated the use of the injection of dead bacteria for therapeutic measures. Vaccine therapy may be divided into three classes, first, the prophylactic vaccines, such as Pasteur advised for fowl cholera and anthrax, and recently anti-typhoid injections. There is no question as to the success of the use of prophylactic vaccines. The intermediary stage between the prophylactic and therapeutic vaccines is best shown by the vaccine Pasteur has advised, which is introduced after the patient has become infected and before disease symptoms have presented themselves. In the therapeutic use of vaccine some stages have been proven.

It seems that the mind of the dentist would travel along the line closest to him with reference to the vaccine treatment. There was no intention in the paper to create the belief that vaccines are curative for pyorrhea. They are not. If pyorrhea were dependent on any particular germ, and we could isolate it I have no doubt we could cure the pyorrhea, but there is no such germ. The object of the use of vaccine in pyorrhea is to cure and prevent the further production of micro-organisms and their toxins in the blood, which micro-organisms were created by the pyorrhea. If the patient does not show that anything is wrong in the system vaccines can be of no use at all, except that they might be of some slight use by stimulating the phagocytes to carry off some of the pus, but that is not what you are after. The object of the vaccines is to cure or relieve the toxins and micro-organisms which have invaded the system. If they have not invaded the system vaccines are not indicated. It is a great pity that the work is not taken up by scientific men as quickly as the men who want to make a profit out of it. The patient gets no benefit from the vaccine, and condemns the profession for using a lot of quack nostrums for curing a disease about which they know nothing. The patient will have no use for vaccines and no use for the individual dentist.

The reason why some chronic infections finally run their course and stop with or without the use of vaccines may be due to the theory advanced by Ehrlich, and called the atreptic theory, which means that the germs floating about in the blood stream have lost the power of becoming attached to the cells. It may be that the germs have used up the material on which they can thrive, and have died off. The immunizing theory may not be the reason why these

germs finally stop, but we have all come to the conclusion that they do stop sometime.

I did not dwell much on the serum containing living bacteria because I thought the topic too long as it is.

One gentleman asked the question: Can we do harm with vaccines? We certainly can. If the patient is suffering from toxemia, and you inject a sufficient amount of vaccine not only to overcome the toxemia, but leave a certain effect in the system, you can do harm. These germs are not excreted as dead germs. It necessary to go along very carefully, and use a small dose. The first dose is practically thrown away. The second dose will produce local reaction. If the whole arm should swell up you have used too much, but if the dosage is controlled I don't think any harm will result whatever.

With reference to what the gentleman says about wishing to use vaccines, I have already stated that the use of vaccines is not for the purpose of curing pyorrhea. The method of obtaining cultures by the extraction of teeth is a very good one where you have a tooth that you can extract.

The germs that are injected are taken up by the phagocytes and digested by the phagocytes and thrown out by the economy in the same manner that other excreta from the blood are thrown out.

I would like to reiterate the statement made by Dr. Knowles, that young men, or older men, who are not thoroughly acquainted with vaccines have no business to use them.

THE FIFTIETH ANNIVERSARY OF THE ILLINOIS
STATE DENTAL SOCIETY HELD IN CHICAGO
MARCH 23-26, 1914.

REPORT OF CLINICS GIVEN BY MEMBERS OF THE ILLINOIS STATE
SOCIETY MARCH 24.

GOLD FOIL CLINIC.

On account of the volume of printed material incident to this large clinic the subject matter of this article must be limited to a few pages. In view of this fact it must be apparent to all that in a

paper on non-cohesive and cohesive gold fillings which is supposed to cover everything from cavity preparation to the finished filling and stay within the limits of a few pages is altogether impossible. If the reader will remember this he will readily understand that it is impossible to have a perfect sequence of facts because of the necessity of many omissions. We can only touch on the more important points.

The history of gold foil fillings is replete with material that makes very instructive and intensely interesting reading. Gold foil in some of its various forms has been quite generally used as a filling material for the preservation of teeth for more than a century. No other filling material known has been used sufficiently long so that we might make comparisons.

In a book published in 1832 more than 80 years ago entitled, "Guide to Operations on Teeth" etc., by James Snell, we find the following: "Amongst the numberless things which have been proposed for stopping teeth there is only one perfectly suitable and that is gold." It may be of interest to note that the author then speaks lightly of the promises held out by the cements for filling purposes and mentions that some of the quacks claim to re-enamel the teeth.

Cohesive (or sticky gold as it was termed when first discovered) has been in use for about 60 years and the record of this form of gold has made one of the brightest pages in the history of modern dentistry. In 1855 Dr. Robert Arthur advised the profession of a new method of preparing gold for fillings. This was the advent of cohesive gold and was a great boon to the profession for immediately contoured fillings were possible and operators were enabled to fill teeth that heretofore were absolutely impossible to fill.

When we consider that it is only about fifty years since rubber dam was discovered and that for many years after the discovery of cohesive gold the proper care and treatment was unknown it is little short of marvelous that these earlier operations have stood the test.

In reviewing the literature of the past seventy years in reference to gold foil fillings, one is amazed at the amount of material

that has been written about the working of gold foil. It is quite safe to state that more has been written on gold foil fillings than any other subject in dentistry.

In looking over these various articles, numbering more than 400 in one journal, (*The Cosmos and News Letter*) we find that in the earlier period there was much confusion in reference to the working of the various forms of gold and especially was this true of cohesive gold.

In Volume VII, page 188, we note that one operator told of this method of annealing gold. The gold was placed in boiling water for three minutes and afterwards put in the oven to thoroughly dry. The author commented on the fact that "while the gold was much softer as a result of this procedure, he could not see that it added very much to its cohesiveness." Another operator telling of his experience with cohesive gold attributed his success to the fact that "his office was close to a dental supply house and he was thereby enabled to get fresh gold for each operation."

In Vol. X, page 133, the following appears, "It (meaning cohesive foil) adheres to the tooth with such tenacity that it can only be extracted by drilling or breaking the tooth and when this is removed the plug will be found covered with numerous small particles of bone adhering to it."

On page 135 of the same volume, one operator in speaking of crystal gold said he had tested it by working in water, saliva, flour, and other similar substances, yet without impairing its adhesiveness or preventing its being formed into a solid plug.

On page 139 another operator said he never took the trouble to dry out the cavities when using it. He rather preferred to have them filled with saliva as it made the gold work better. Another finding it sometimes difficult, especially in upper teeth to fill the cavity with saliva, thought it quite as well to mix the gold and saliva in a mortar first.

Prior to the formal introduction of cohesive gold it was deemed desirable to get rid of this property of stickiness and copper was added, or the gold was treated with sulphur.

CAVITY PREPARATION.

A most important part of the success or failure of a gold foil filling is in the preparation of the cavity. Because of the lack

of time only two types of cavities can be considered, but the principles as given practically apply to all cavity preparation.

The two cavities demonstrated are the mesio-occlusal of an upper first molar and a mesial of an upper incisor. Both are in typical teeth, teeth that are well formed and all conditions and environments normal. Both cavities represent the minimum amount of extension required in their respective classes, and the outline of these cavities by no means an indication of cavities that might be made necessary by other conditions. As an illustration of this we will call your attention to the bucco-lingual diameter of this cavity which might be two or three millimeters wider in a case where the individual was specially susceptible to dental caries. The extent of this cavity bucco-lingually would be governed by a number of other conditions, a few of which we will mention. The convexity of the mesial surface bucco-lingually and occluso-gingivally together with the broadness of the point of contact are three important factors governing the extent of this bucco-lingual diameter.

There are a number of other conditions, such as the age, the immunity or susceptibility to caries, the condition of the soft tissues and the habits of the patient which must be taken into consideration, but lack of time does not permit a discussion of these details. The important thing that we should do is to include within the cavity outline the area of liability, extending our margins to an area of cleanliness, thereby placing our margins in an area of immunity. Having done this we have reached the ideal position for the cavity margins as far as extension for prevention is involved.

In filling the mesio-occlusal cavity in the molar we are going to use non-cohesive gold in the gingival third. This non-cohesive gold may be placed in one, two or three cylinders and after being placed against the gingival wall the cohesive gold will immediately be built into the non-cohesive gold. The details of this building or the stepping process of the gold plugger will not be gone into at this time.

At this particular place it might not be amiss to call attention to the common error of mistaking the hardness of filling or specific gravity as an indication of the true worth of a gold foil filling. Specific gravity does not necessarily indicate the value of a filling. For example: two fillings might be placed in cavities ex-

actly alike—one might be condensed into an extremely hard filling, having a specific gravity of over 19 and yet be a failure as far as hermetically sealing the cavity, due to the failure on the part of the operator to adapt or wedge the gold against the walls. The other filling might have a specific gravity as low as 15 and yet hermetically seal the cavity, due to the operator having taken advantage of the wedging principle while building the gold. The latter with perfect adaptation and a specific gravity of only 15 will make a permanent filling and the former with a specific gravity of over 19 is a failure.

We hope that every dentist will appreciate that we are not decrying other filling materials such as gold and porcelain inlays, amalgam, etc., for we recognize that each has its place and we believe that any operator who uses one material to the exclusion of the others is not doing the best for his patients. There is no best material except for a given case.

If we are to get the best results that are possible with gold foil we must use it only where it is indicated. We unhesitatingly proclaim that in certain types of cavities gold foil would be the poorest material an operator could possibly use. A concrete example of this type would be a large proximo-occlusal cavity in a bicuspid or molar especially where the pulp has been removed. The removal of the pulp has taken away a very important part of the dentin that supports the buccal and lingual wall and in this weakened condition these walls will not permit of wedging gold between them. The following then can be taken for a definite rule in placing gold foil fillings. Gold foil fillings are never indicated where any wall of the cavity has been weakened which prevents the gold from being wedged against all the walls or where any other condition precludes the possibility of proper condensation of the foil.

Reversing the foregoing statement we will have a positive indication for gold foil fillings. Where the walls are sufficiently strong and other conditions permit of wedging the foil we maintain that gold foil can be made into a permanent filling which seals the cavity in a manner not possible with any other known material.

One of the features of this clinic is the gold foil filling wedged between parallel walls in an ivory block. This groove in the ivory

block has been cut with walls as parallel as it is possible to make them. The cavity is open on both ends and has no pits, undercuts or any other retention excepting that offered by parallel walls. Into these grooves, which are two millimeters wide and two millimeters deep, gold was built taking advantage of the elasticity of the dentin by means of the wedging principle of building gold. By this method we actually build a gold filling that is larger than the original cavity, and when so placed the walls of the cavity are forever holding this filling in place. In the tests that have been made in the block with fillings ten millimeters long it has been found that the filling will sustain more than 60 lbs. weight before it is disturbed. Experiments have been made with dentin showing that it can be made elastic up to 8% without injury to the dentin. This is far beyond the necessary safe limit in wedging the gold between walls.

While no definite experiments have been made measuring the elasticity necessary for a gold filling to hermetically seal a cavity, it is quite probable that 1% is sufficient to obtain the desired result.

Committee.

F. W. Gethro,
Chairman.

D. M. Gallie.
L. S. Tenney.

Clinicians.

E. H. Allen.
J. W. Birkland.
J. H. Conroy.
C. C. Corbett.
Jas. W. Cormany.
Hugo Franz.
W. O. Fellman.
M. L. Hanaford.

J. L. Hoover,
G. B. Macfarlane.
Edmund Noyes.
Adelbert Olmsted.
F. W. Stephan.
C. B. Sawyer.
Amos Waltz.

GOLD INLAY CLINIC.

We believe the indications for gold inlays to be chiefly in those cavities which are so extensive or so difficult of management by foil as to make them too great a nervous tax on the patient to have foil inserted, and where by reason of these limitations a better

technique can be obtained with inlays than with foil. With this idea in mind we have selected for demonstration such cavities as are shown in the models.

First is that of an upper bicuspid with a cavity extending from the gingival line on the mesial surface, across the occlusal surface to the gingival line on the distal surface. This kind of cavity is called a mesio-occluso-distal cavity or more briefly an "m-o-d" cavity. It is manifestly an exacting cavity to fill with gold foil, and we believe it can be better managed by the inlay method than by any other. There is one point of difficulty which must be recognized in making this kind of an inlay: viz.—the distance between the two extremities, or in other words, the two gingival margins. This introduces the possibility of a slight shrinkage in the materials employed in the casting method. This danger of shrinkage is not confined solely to the gold but must be reckoned with also in the wax of which the model is made. The wax must be well condensed and in adapting it to any proximo-occlusal cavity it is necessary to use some form of matrix to contain it so that it may be well condensed and forced out past all the margins. The matrix may then be removed and the wax carved and smoothed to the margins.

Bands of different sizes made of thin copper may be trimmed and fitted so as to form a matrix for any proximo-occlusal cavity. The slightest shrinkage of either the wax or gold will result in a certain defect which we fear is too frequently overlooked by the operator—a failure of either gingival extremity of the inlay to go perfectly to place against the gingival wall of the cavity.

To obviate a discrepancy at this point it is believed to be good practice to treat the gingival margins of these cavities in a way wholly different from that indicated for gold foil fillings. With foil these margins should not be extensively beveled, but for inlays we believe better results will be obtained by beveling quite freely and creating a lap joint instead of a butt joint. This slight overlap of gold when dressed down even with the root surface will prove an ample protection to the cavity against recurring caries even where there has been a slight shrinkage of the gold.

The cavity preparation aside from this is along the conventional lines of flat seats joined to the surrounding walls at nearly, though

not quite, right angles. The advantage of anchoring inlays on flat seats relates not only to greater security against stress but also to greater precision in cementing the inlay to place. If the seats of cavities are curved there is never an assurance that the inlay will go perfectly to position under pressure when the cement hides the cavity somewhat from view, but if the seats are flat and the walls nearly perpendicular the inlay has no other alternative than to slide to its proper place when pressure is brought to bear upon it.

This model shows a cavity cut in this way, with an inlay cast to fit it and the mesio-distal width of the tooth reproduced by the formation of contact points on the proximal surfaces.

The second model shows a class of cavity which is occasionally seen in molars, and which cannot be filled so perfectly by any method as by the inlay. And yet at first sight it would appear to be a cavity from which the inlay method was excluded. The cavity involves the proximal and occlusal surfaces of a molar with a considerable extension along the gingival third of the buccal surface. This extension may originally have been a separate cavity in the buccal surface, which has subsequently joined the main proximo-occlusal cavity. Manifestly on account of its form, a wax model cannot be fitted to such a cavity and removed without distortion, and this is the reason why this cavity does not appear to lend itself to the inlay method. But the difficulty is overcome and a perfect operation made by employing a sectional inlay—filling the buccal portion with one piece and the proximo-occlusal with another, and allowing the two to come together in such a way that when cemented and polished they look like one inlay. This makes a very serviceable restoration, and one which is not difficult to make when the principle and technique are understood. It will be noted that at the termination of the buccal part of the cavity a slight interlock is given the inlay by making the angle between the axial wall and the end of the buccal cavity rather acute, which acts as a dovetail to the inlay at this point. In seating this piece of the inlay it should be dropped into the cavity near the proximal surface and with a sliding motion forced toward the extremity of the buccal cavity which locks it into place. After the buccal section has been cemented to place a disk is run over the proximal margin making it continuous with the buccal margin of the proximo-oc-

clusal cavity, and the second section of the inlay is then made as a simple proximo-occlusal filling. Then this section may be cemented to position. If a disk in the engine is spun over the joint where the two sections meet it will obliterate the line and make the operation look like one inlay.

For the third model shown your committee is indebted to the suggestion of Dr. H. N. Orr. In many cases of bicuspid in adult or old age where there is a recession of the gum and an opening of the interproximal spaces a decay will begin in the gingival portion of the proximal surface, leaving too great an area of sound tissue between the cavity and the occlusal surface to justify the operator in opening the cavity to this surface. These cases may be very serviceably met by the inlay method—cutting the cavity from the buccal aspect and inserting an inlay as illustrated in the model. One feature of this operation may be referred to as an endorsement of the method. It is not necessary to seriously lacerate or injure the gum in inserting such an inlay, and in every instance where it is carefully performed and the margin of the inlay left even and flush with the gingival margin of the cavity it will be found that the gum tissue will cover the margin of the inlay and become more healthy than it has previously been when lying against the roughened surface of the tooth. By this operation the condition of the gum in the interproximal space may be greatly improved.

The fourth model illustrates a proximo-occlusal cavity in a molar extending over the buccal or lingual marginal ridge to the pit in the buccal or lingual surface. This lapping over of the gold to the buccal or lingual surface introduces the same element of uncertainty in casting as was mentioned in connection with the "M. O. D." cavity in a bicuspid. In many instances even with the greatest care in casting it will be found that the buccal or lingual extension of the inlay will not go perfectly to place leaving a narrow space between the gold and the cavity wall. This slight discrepancy, when perfectly filled with cement in this particular region may not militate seriously against the serviceability of the inlay, and yet every painstaking operator will welcome any method which will close the joint and leave no cement line in sight. This can be done by freely beveling this margin allowing the wax to extend over the bevel in the form of a lap joint. Then when the inlay

is cast and cemented a disk in the engine spun over the gold in the direction of the enamel will tighten the joint so that no cement line will show. In the present instance only the wax model of the inlay is shown, which it is believed will amply demonstrate the principle involved in this kind of restoration. It is always well to leave the wax model a trifle flush over the buccal margin so that there may be some excess of gold when cast. This will ensure ample material to spin over the margin and tighten the joint. It will be noted by examining the wax model that some care has been exercised in carving and polishing the wax. It is believed that much time may be saved subsequently by this procedure, so that the gold may come out of the mold as nearly as possible perfect. After the carving is done on the wax with an instrument it may be further smoothed and polished by wiping the surface with a pellet of cotton moistened with oil of cajeput.

We are indebted to Dr. J. E. Nyman for the following suggestions regarding technique:

"The patient is allowed to hold a mouthful of water as warm as can be tolerated for a few minutes before the wax is inserted. Cool water, but not ice water, is used in the mouth to harden the wax just before removal. After removal it is placed for about five minutes in a fifty per cent solution of nitric acid, then washed with cool water and finally washed with a solution of liquid soap. Mix the investment with tepid water of about eighty degrees Fah. instead of cold water.

"Do not chill the wax model just before investing, rather dip it for a few moments in water of about eighty degrees Fah. If Taggart's investment is used, mix for one minute, jar and rotate bowl for two minutes. Twenty minutes after investing begin to heat and burn out the wax, which should not require more than twenty minutes. Let it cool for fifteen minutes, then proceed to cast, using an alloy of two parts pure gold and one of twenty-two karat solder.

"Inlays cast on this schedule as to time are more perfect in every respect than is usual when greater periods of time have been allowed to elapse."

In the fifth and last model will be seen demonstrated a principle which is felt will meet certain cases which in the past have

proved difficult of solution. In an incisor exposed to view, with a cavity in the proximal surface gone sufficiently to involve the incisal angle two problems are introduced—the one of inserting a filling which will not be conspicuous in appearance, and the other of obtaining sufficient strength to the filling to withstand the stress exerted upon it. The experience of the past has amply demonstrated that in many of these cases the only material which will stand this stress is gold, and it is equally true that gold when exposed to view in the mouth is an offense to esthetic taste. The present plan would seem to meet the situation more satisfactorily than any other yet suggested. The idea is to cut the cavity for a gold inlay, making if possible a step anchorage at the incisal for greater stability and also for protection of the incisal enamel which is still standing. A wax model of an inlay is made restoring the original contour of the tooth just as if the entire inlay were to be of gold. Before the casting is made the wax is trimmed away from the labial surface of the inlay wherever it will be exposed to view in the mouth, and a cavity cut in the inlay at this point to receive a facing of some material which will harmonize sufficiently with the natural enamel to be inconspicuous. Low fusing porcelain was formerly used for this purpose but the recent improvement in silicate cements would seem to favor this as the best material for the purpose. It is a comparatively simple matter to secure sufficient anchorage in the gold to hold the silicate in place, and when a good match is made with the tooth the effect is very artistic.

We have in this inlay a distribution of material which combines the strength of the gold at the point where stress is exerted upon it, with the gold hidden from view by the facing of silicate cement over it.

It goes without saying that the material of which this inlay is cast should be quite strong, owing to the fact that in many instances there are certain places on the inlay where there is not much thickness. Pure gold for this reason is seldom indicated, being too soft and yielding. Dr. Orr, to whom we are indebted for the model being shown, suggests 22K. gold solder as being the most serviceable material for this purpose.

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PORCELAIN CLINIC.

Inlay.

Porcelain is one of the best materials we have in dentistry for restoring lost tooth structure, and can be employed anywhere and everywhere according to the ability of the operator to use it. Time will not permit of any extended arguments along these lines and all we can do is to state some facts dogmatically and to the unbeliever hope at some future time to have the opportunity to prove them.

Porcelain is compatible to tooth as no other material we have ever used. It is an almost perfect nonconductor of thermal changes—and the nearer the approach of the cavity to the pulp, the greater the indication of porcelain for the restoration, even where you are fearful the pulp might die under an all cement filling, there is little or no danger of pulp disturbance after a porcelain filling is cemented to place.

Porcelain comes the nearest to filling all esthetic requirements. With porcelain you can match the tooth so closely that at conversational range it will not be detected, and to all intents and purposes the teeth are in normal condition.

Porcelain is the only material that gives any protection to adjoining tooth surfaces. Glazed porcelain will not hold any deposit—or gelatinous plaques, therefore just to the extent that the

surface of a tooth is replaced by porcelain, there will be that per cent of protection to the adjoining tooth surfaces.

Porcelain that is fixed in the mouth should always have the glaze of the furnace.

In using porcelain for filling, cavity preparation comes first. Several rules or principles should govern cavity preparation for porcelain. First: all decay removed. Second: Margins extended to glistening enamel. Third: Divergence from paralleled walls. Fourth: All undercuts obliterated. Fifth: Margins bevelled to knife-edge with outer-surface of tooth. Sixth: Cavity formation for surface retention. Seventh: A seating form for setting.

If the law governing the retention of an inlay in a tooth was understood, then a better conception of cavity preparation would follow. The law of physics governs the retention of inlays and not the law of mechanics. The greater the area of surface that can be absolutely fitted, the greater pounds pressure it will stand before dislodgement. Therefore prepare your cavities so that you have the largest area of surface you can get without cutting more than you need to reach good sound tooth substance, and avoid all complicated forms that present a mechanical form to prevent lateral dislodgement before cementation that can not be accurately fitted, for you will loose more strength of retention from ill fitting than you will gain from increased area. Do not have any flat surfaces or sharp corners for they will prevent the excess cement flowing out when you set the inlay, and you can not apply force enough to overcome this. The less cement to complete the joint, the greater the strength of attachment. Rather have a cavity formation that permits the inlay entering from one direction on the wedge principle with round corners and no flat surfaces and the cement will exude easily and you will have the minimum of cement and the closest joints possible.

Use stones in preference to burs in preparing a cavity. Finish the margins with Arkansas stones.

In making the matrix one one-thousandth platinum is used. Cut a piece large enough to lap over onto the tooth. Many make the mistake of only having a piece large enough to barely cover the margins, or after outlining the margins of the cavity trimming down close to the margins. The folds that come from the margins outwards will

stiffen and strengthen the matrix so that there is no danger that the matrix will warp from the baking of the porcelain. The matrix will be stronger than the pull from the shrinkage of the porcelain in fusing. Having cut a piece large enough, anneal in a bunsen flame, and using pellets of cotton, the first of which you wet. Depress the platinum towards the deepest part of the cavity, packing with pellets of cotton until you have carried the platinum into the cavity as far as possible and it is held firmly, then straighten back the platinum until you can pass a piece of tape up without dislodging it. With the tape holding the platinum firmly on the margins, bring the tape back so as to carry the platinum back upon the tooth and holding it there burnish over the tape until you have conformed the platinum to the tooth and cavity. Remove and anneal, replace in cavity and holding as firmly as possible, proceed to burnish every portion of margin and cavity using suitable burnishers for the place you are working on, until you are satisfied that every part is well burnished. Remove and anneal, replace for last step. Now while you have held it as firmly as possible, as you have burnished on one part, it will lift more or less from another part, but now you can correct this by taking a strip of rubber dam, passing it up between matrix and adjoining tooth and stretching back over the matrix. Confine the matrix to cavity and tooth, then with the big ball end of the burnisher, burnish over the rubber dam. If the dam is wet the burnisher will slip easily and not cut the dam. The rubber dam will hold the matrix to the tooth so that one part can not spring away while burnishing on another place. The result will be that you will have a matrix that is in absolute adaptation to cavity and tooth and there will be no need of going to the tooth again after a baking to get final adaptation of the matrix.

Color selection is on a different principle than the selection of a tooth or facing for a crown or bridge. In selecting a tooth or facing you select one that harmonizes with the adjoining teeth in the locality in which it is to be placed. In selecting the colors for your inlay, you look for underlying colors in the tooth and find them by harmonious comparison with the color guide.

The color guide furnished with a porcelain outfit is intended to show, that from any given bottle, if you bake a piece of porcelain the same bulk as the shade guide you will produce the same color,

a lesser bulk will be a lighter shade. As has been said you look for underlying colors, and place them in the same relative position in the inlay as you find them in the tooth.

To illustrate we will take a typical light yellow tooth at the first glance holding the number two yellow of the Brewster shade guide to the tooth, one would say, "If I can bake an inlay that color it will be fine," but on closer analyzing of the colors in the tooth you will find that in the cervical third the yellow is stronger, that in the middle third there is a gray effect and the incisal third has a tinge of blue. You will have to have these colors in these localities to produce an inlay that will match the tooth, and you can produce them by baking layers of these colors in their respective localities, over all you then bake of the number two yellow and the underlying colors will show through and give the shaded effect you have in the tooth.

Bodies: We have not the time to enter into the discussion of the merits of high and low fusing bodies, sufficient to say that high fusing porcelain permits of the baking of inlays in layers and the producing of contours and color effects that are very satisfactory.

Inlays should be baked in layers, for thereby you can produce color effects that you can not otherwise do. Baking in layers prevents light absorption and refraction and thereby prevents to the greatest extent possible, the so called, shadow problem.

Manipulation: Mix sufficient foundation body on a slab as stiff as you can and draw moisture, then piece by piece place in the matrix and settle by vibration. Do not try to get exactly the amount you want to bake and no more, rather fill the matrix and when you have enough and to spare, dip it into dry powder to absorb what moisture remains and then carve away the excess until you have what when baked will make the lingual half of the inlay. On this foundation then bake of the number three or number four yellow, a portion in the cervical third as illustrated, then in the middle third bake of the gray, and at the incisal third the blue. Over all you will then bake of the number two yellow to fill to full contour and carry this baking to a full glaze. As you bake an inlay restoring part of the cutting edge of the incisors or a compound inlay in molars or bicuspid, handling it carefully you

can try it in the mouth to see if your lines are running all right.

After the matrix is completely filled so that by handling you can not distort and change the fit, you can grind if necessary to correct shape and contour and then glaze in the furnace.

Cementation: Strip the matrix from the inlay and imbed in melted wax leaving the cavity surface exposed and etch with Hydrofluoric Acid for about one minute, mechanically cleanse with water and a flat stiff tooth brush. Try in the cavity and show the patient with the inlay held in place by capillary attraction, for after cementation the tooth will be several shades lighter from dehydration and it will be several days before the tooth comes back to normal color. Then wash in chloroform to remove any suspicion of wax or saliva that might have remained on the inlay. Have powder and liquid on the mixing slab and wooden or bone spatula handy. Place saliva syphone in mouth and cotton rolls in proper place to dam back saliva and dry out the cavity. Then wash out with warm alcohol to cut out any film of mucous that might be present and to hydrate the tooth. Mix the cement to a creamy consistency, the slower the powder is drawn into the liquid, the slower the setting. Fill the cavity full of cement for all excess can be forced out and there will be no danger of an air space under the inlay. Force the inlay home to place and hold under pressure, either wedge or ligature. Leave it under pressure until the cement remaining on the slab, will show a glistening surface and will not stick to the fingers, when rubbed, and but faintly show a finger print. At that stage moisture may be allowed on inlay and cement and the wedge or ligature removed and in about a minute more the excess cement chipped away and the patient dismissed.

PORCELAIN SHELL RESTORATIONS.

Porcelain shell restorations are without question the most perfect and artistic work from all standpoints we have ever done in dentistry, for it is restoring to normal conditions and they are indicated anywhere that you have tooth enough left or where you can restore by cement filling or cemented casting to a form that will be as the dentine stripped of its enamel.

Never devitalize a tooth for a porcelain shell as there is no danger of a pulp dying under a porcelain shell. In describing the

preparation we will consider that tooth is alive or has been restored by cement filling or casting to the condition of a vital tooth. When we say you strip the tooth of its enamel with a shoulder formed at the free margin of the gum we have said all there is to say. The *modus operandi* is as follows: and you can remove the enamel from a live tooth without any discomfort to the patient if you are careful and use stones under a stream of cold water, and do not force their cutting.

Treating a central incisor as the models illustrate starting about one-third in on the cutting edge with a carborundum-rubber disk. Seven-eighths of an inch in diameter, you will take a slice of both approximate sides terminating at the gum with a shoulder no deeper than the thickness of the disk. Then shorten about one-fourth the length. Next strip the enamel from the labial and lingual surfaces and then form the shoulder just under the free margin of the gum so that you do not make the gum bleed. Thus the gum will hide the joint when the shell is set, the less shoulder the easier fitting.

The small inverted carborundum stones will prepare most of the shoulder, in some places the fissure bur will be needed. Take a wire measure above the gum, this needs but to approximate the size, and to make the matrix cut a piece of platinum a trifle longer than the measure and taper so that when lapped and soldered with a piece of pure gold the size of a pin head, you will have a cone of a size and length that will permit of trimming to a fit. Trim until the platinum just touches the gum all around and will just pass over the shoulder. Then carefully work the cone under the gum and over the shoulder and press it home until it binds on the shoulder, then press the platinum to the labial and lingual surfaces with the finger and thumb. At all times the pressure gumwards. With the foil carriers pinch the platinum to the tooth on the approximate surfaces and lay this fold backwards lingually. Then pinch in the end and fold that back and burnish the end thoroughly to place. Now the matrix can be held firmly in place with the thumb on the end, and with a round nose burnisher, burnish from the end towards the shoulder until you are satisfied that you have a perfect fitting matrix. Withdraw it slightly a few times to relieve it from binding under the gum so that it

will come away in the wax impression. A matrix made as a soldered cone with the folds ironed down upon the tooth, will be so ridged that the porcelain in fusing can not contract the matrix.

There are several methods in making shell restorations. The Committee believe that for simplicity and accuracy the use of a porcelain tooth gives the best results.

A plate tooth is selected that is a perfect match or in perfect harmony with the adjoining teeth and approximates in size and form what is wanted.

A plate tooth is preferred to a facing as the sides will extend beyond the line of vision and will form a shoulder that will enable you to take it away in the wax impression with more accuracy. Grind and shape the tooth until it can be set on the matrix in perfect alignment and is the absolute size and form you want the finished product to be.

At this stage the patient can see and know just what the result will be, and if any criticism is offered it can be easily remedied at this time.

Carborundum stones run under water will quickly prepare one of these facings. About twenty minutes is the average time taken.

Everything being ready, set the facing in position and hold it there by engaging the finger lengthwise across the teeth so that there will be no danger of movement. Having ready a piece of gutta-percha wax of the right size and warmed enough to be moldable, press up from the lingual side until the matrix facing and adjoining teeth are engaged, but the cutting edge of the facing not hid. Remove you hold, you can now inspect and verify its correctness. Again holding firmly press the wax home until you have a good impression of the lingual surface and the facing is held approximately and on the cutting edge. Chill with cold water and remove. If the matrix does not come off with the wax impression, it can be removed and dropped into place. An ordinary pair of iron pliers is taken one end or beak of which, is encased in the end of a lead pencil eraser to engage upon the porcelain facing. The other beak of the pliers, entering the cone of the matrix, you adjust until you find a common resting place for both beaks without movement of matrix or facing. Lock in

this position and lift out of the wax impression. The matrix and facing being wet, with the saliva as you worked, will not stick to the wax.

Use one of the high fusing bodies of a color suitable for the cervical portion of the crown. Mix very thin and starting at one point only on the side add and jar and add more until it has appeared all around between matrix and facing. Then mixing it stiffer add and jar using other suitable bodies as you approach the cutting edge until you have a layer covering the matrix that when baked will equal in thickness the enamel you removed. Have a number of fire-clay cones that will fit in the holes of the fire-clay slab. By this time the body has dried out so that it can be handled in the fingers. Placing it over one of these cones carry it into the furnace and bake with a slow furnace and a longer time on a medium point of the rheostat rather than strain the furnace at its highest capacity for a shorter time, let cool slowly, and if necessary bake a second time to correct any defect.

When completed strip out the platinum matrix and if any place sticks, cut it out with a bur and not a stone as stones would cut the porcelain and change the adaptation.

Cleanse the shell with alcohol. Use special inlay cement mixed to a creamy consistency to set shell. Force it home and with a piece of wood and mallet gently tap it until all excess cement is forced out and apply pressure with a soft piece of rubber eraser that will cover several adjoining teeth and allow them to imbed in it to prevent lateral movement.

Maintain this pressure for two or three minutes.

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AMALGAM CLINIC.

THE PROPER MANIPULATION OF MATERIAL AND TECHNIC NECESSARY
FOR AMALGAM FILLINGS, FORMULATED AS A RESULT OF
FOUR YEARS' WORK WITH THE AIR PRESSURE AP-
PARATUS AS A TEST FOR THESE REQUIREMENTS.

The excellent and, at other times, disappointing results which time develops in some of the amalgam work of our most skilled operators, indicates most emphatically either a lack of knowledge or failure to uniformly carry out the proper technic in the mixing of our amalgam fillings. This alone is sufficient reason for the presentation of this outline on such an important subject.

If these directions make sufficiently clear and emphatic the important details presented, much will be accomplished in the direction of greater uniformity and stability in our amalgam work.

As a result of the invention of the air pressure apparatus for a test of our amalgam technic, as well as of the quality of adaptability of the alloy used, much progress has been made possible by providing, for the first time, a reasonably accurate measure of the results accomplished. The quality of adaptability is a supreme essential in our alloys, and must be considered separately and distinctly from the quality of shrinkage and expansion. It is in this respect that the micrometer has failed to meet our needs, as it is a measure of movement only and not adaptation and technic.

The proportions of alloy and mercury necessary to make a proper mix of amalgam vary in different alloys. Such proportions are usually found in the printed directions accompanying the alloy and should be rigidly followed, unless the experience of the operator has necessitated a slight change in such proportions.

That these proportions be correct, is quite imperative, as an insufficient amount of mercury results in a retarded or an incomplete amalgamation due to lack of free mercury as all alloys demand. And, on the contrary, if an excess of mercury be used, the filings glide around or float in the mercury which inhibits the mercury being properly rubbed into the alloy by moderate friction as it should be. It is the opinion of the highest authorities, as well as the experience of the profession at large, that the use of a slight excess

of mercury facilitates amalgamation and is in no way injurious, provided such excess be removed before the completion of the filling. This may be accomplished by the usual method of expressing the excess mercury by pinching between the thumb and finger during the kneading; or it may be removed as it is expressed to the surface during the packing of the amalgam in the cavity.

For convenience sake, capsules filled with 10 grains of alloy, and others containing the proper proportion of mercury should be carefully weighed and filled by the assistant or by the operator when opportunity affords. Convenience, however, is not the only advantage to be derived from such procedure, for it will also result in an astonishing saving of material. Especially, as the operator learns to estimate closely the amount required when handling the alloy in definite quantities. For instance 10 grains, or one capsule is recommended as a desirable amount which may be used for a small cavity; two capsules for a cavity of medium size; and three capsules for a large cavity.

Proper mixing may be done by means of an automatic device operated by the dental engine (mfg. by Gideon Sibley) as per directions, or by the use of a deep glass mortar, the inner surface of which has been dulled by acid (not ground) and pestle of such design as to afford a firm grasp being taken of its handle. The head of the pestle should also be dulled by acid. The time required, and the rapidity of movement of the pestle necessary for thorough amalgamation, make the use of the shallow mortar impracticable because of the danger of loss of some of its contents during the operation. A rough inner surface of the mortar tends to grind the alloy, which is very objectionable, aside from making it extremely difficult to completely remove the plastic mass, and keep the mortar clean.

Mixing in the deep glass mortar should be done thoroughly by a rapid movement of the pestle in such manner as to keep the mix always at the bottom of the mortar. This method will necessitate the constant rubbing or shaking down of that portion which collects on the sides. The force exerted in mixing should not be one of grinding, but of moderate rubbing together, which accomplishes the most complete amalgamation. Such

mixing should be continued for two minutes by the watch as a minimum length of time, followed by kneading the mass in the hand for one minute at least. Some alloys might require a little more time for mixing but never less (I am speaking of the high grade alloys containing 65 to 68 per cent of silver, as these are the only ones worthy of consideration).

If the proper proportions of alloy and mercury have been used, and the necessary time and thoroughness have been taken in the amalgamation, the mass will show a degree of plasticity indicated by slight sloppiness, a condition of plasticity most favorable to uniform results in adaptation in cavity walls.

The mass should not, however, be so plastic as not to retain its form when made into a roll, as such condition is considered excessively sloppy. If, in the final kneading, any crepitus or indication of setting is felt, the mix is unfavorable except for very small cavities.

Uniformity of results in adaptation to cavity walls appears to be more dependent upon the condition of plasticity during the packing, than has been recognized by amalgam authorities and the profession in general. These observations are the result of extensive experimental work with the various well known alloys tested with the air pressure apparatus, and have been conclusive to those operators who have participated in the work.

My records show that over ninety per cent of the operators whose work has come under my observation, make an incomplete mix, due in almost every instance to insufficient time being taken, and to the limitation of rapid rubbing by using a shallow mortar or only a hand mix.

This incomplete amalgamation is probably the cause of those bulk changes which time develops in some of our fillings, and this faulty technic will also explain many discrepancies in reported tests recorded on the micrometer which do so many of our reliable manufacturers a great injustice.

The packing should be done with flat serrated faced pluggers. Experiments with every conceivable variety of plugger forms including flat and convex, smooth faced, serrated faced, and ball burnishers of every description show that a very limited

number are necessary to meet the full requirements of an every day practice. The following selection will be found sufficiently complete, viz :

A large 3.5 millimeters in diameter.

A medium 2.5 millimeters in diameter.

A small 12x18 tenths of a millimeter angular plugger, all having a flat serrated face. Such measurments are of course approximate and may be varied slightly to suit the desires of the individual operator.

The character of the plasticity of the amalgam at the start and during the packing is an important factor, and is absolutely essential to reasonably uniform results in adaptation. It is impossible to note the resulting defects if the micrometer is used as the test, for this instrument is a measure of movement only and not a test of adaptation. It seems to be generally and erroneously accepted that the test for movement covers and provides a test for that quality or attribute, adaptation, so essential to the making of a non-leaking filling. The air pressure apparatus, however, does provide a test for adaptation.

Test fillings made by competent operators, using alloys that show a perfect record on the micrometer, leak as commonly under one pound as do fillings made with alloys that show a considerable range of movement. Many test fillings made of alloys that shrink as much as one point or expand as much as six or seven points showed perfect adaptation under pressures of 20 to 40 pounds and continued to do so throughout the time of movement as shown by repeated tests on the micrometer. These test fillings were made in mesio-occlusal as well as in simple round cavities. These statements are based upon the experiments of different operators, doing the same line of work; and, if the observations are correct, they are sufficient to show the error of our dependence upon the micrometer as a test for leakage of our alloy fillings. The poorest gold filling placed in a cavity will show as perfect a record on the micrometer as the best gold filling that it is possible to make, because gold does not shrink nor expand; but this does not prevent leakage resulting from faulty manipulation or other causes.

With the proper proportions of alloy and mercury and the mixing done as above described, the quick setting high grade alloys will show a condition of plasticity bordering on sloppiness, which appears to be the most favorable condition of the mass to secure perfect adaptation. The medium setting high grade alloys may require the removal of a small amount of the excess mercury during the final kneading, to avoid excessive sloppiness.

Now to continue with the packing. Take a piece of the very plastic amalgam sufficiently large to cover the floor of the cavity and pack with all the force of the pen grasp (with as large short steps in concentric order from the center of the filling to and around the walls, removing the excess mercury as it appears upon the surface. Follow this use of the large plugger by stepping in a regular order into all angles and around the walls with the smallest plugger (about 12x18 tenths of a millimeter in diameter) repeating this procedure as each piece is added. The surplus expressed during the operation may be used again by pinching out the excess mercury, leaving the remaining mass as plastic as the whole mass was at the start. When finished with an excess, a few minutes should be allowed for the setting, after which the filling can be trimmed to form and polished at a subsequent sitting.

Three details of technic appear to be equally important and essential to secure perfect adaptation, namely:

First, thorough mixing and a decided plasticity of the mix during the packing.

Second, compression made possible only by the use of flat faced serrated pluggers and the use of the matrix if any of the surrounding walls are missing.

Third, an order in the stepping of the plugger which will insure covering the entire surface of the filling as each piece of amalgam is added to the filling, with special attention paid to the walls and angles of the cavity.

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CEMENT CLINIC.

SOME CONSIDERATIONS REGARDING THE SILICATE, AND OXYPHOS-
PHATE OF ZINC, CEMENTS.

In a study of the Silicate cements such as the time at our disposal permits the Committee has decided that it will be impossible to enter in detail into the consideration of the various cements now on the market, for which the different manufacturers claim different qualities, and different methods of mixing and manipulation, so it will be our purpose to consider them in a general way, noting such points as may be said to apply to them all in common.

This will include the technic of mixing and insertion, the best kind of instruments to use, cavity preparation, the cavities for which they are most indicated, and in which they are most likely to be successful, the influence of temperature, the proper mixing slab, and how to keep it at the proper temperature, also some consideration of the Silicate cements in combination with gold inlays to produce more esthetic results.

The Silicate cements at present on the market are composed principally of the natural silicates, aluminates, rare earths, and

calcium, which latter element goes largely to determine and make the setting process. The rare earths are used to influence the formation of different colors.

The liquid used is modified phosphoric acid, one manufacturer claims a minimum amount of acid, and a reaction by simple hydration, thus eliminating much of the possible trouble and irritation to the pulp due to the excess of free acid left in a mixture of silicate cement, the mineral components of which are much less soluble than the oxide of zinc.

All the silicate cements are synthetic, in other words made by the union of, or combination, of different elements.

As regards the mixing and insertion of the silicate cements, it may be laid down as a general rule that they should be mixed quickly, the necessity for a gradual incorporation of the powder into the liquid does not exist as in the oxide of zinc. The main point is to get into the liquid as much of the powder as it will take up to bring it to a thick putty consistency, so thick that it rather shows an inclination to follow the spatula on being patted but does not do so. Everything should be ready for immediate insertion, the material forced well into undercuts and over the margin, then brought quickly to place with a clean dry celluloid matrix if in proximal cavities; the matrix should be held steadily in place for a couple of minutes, when setting will have sufficiently progressed to prevent disturbing the filling by its removal.

Here we wish to emphasize the importance of obtaining good separation for all proximal fillings, as well as the importance of absolute cleanliness of all instruments, and in all detail of these operations.

At all times unless absolutely impossible use the rubber dam. Most of the silicates can now be finished within five minutes of insertion, using strips slightly covered with coca-butter, always drawing same towards the margins, after finishing, the filling should be covered with paraffin or varnish supplied for that purpose, before the rubber dam is removed.

As regard cavity preparation, note that margins should not be beveled as for gold inlays or fillings, but left as square as possible. Silicates are most indicated in proximal cavities in the anterior teeth, also in cervical cavities where absolute dryness can be

obtained, and maintained long enough for the insertion and finishing of the filling. Silicates are not indicated in cavities with great lingual extension, or incisal destruction.

In mixing the cement, an agate spatula should always be used, ivory or bone instruments are the best for inserting fillings, steel or tantalum are allowed by some manufacturers, but experience for the most part shows them to be contraindicated.

We all know that the mixing of cements calls for a chemical reaction, and that chemical reactions are influenced, by temperature, therefore if we want to get a proper reaction, not too fast, not too slow, we must mix our cement on a slab of proper temperature. This refers particularly to the silicates.

The setting of cements can be influenced by the properties of both liquid and powder, but apart from this temperature is an important consideration, and it has been satisfactorily demonstrated that a slab at a temperature of 60 degrees Fahrenheit gives us the proper reaction.

The reasons for this are two fold, a slab at a temperature much above 60 degrees gives us too fast a reaction and setting, a slab at a temperature much below 60 degrees gives us too slow a reaction, and a filling material which when vital teeth are to be considered is too cold to be inserted without endangering irritation to the pulp.

The principal point to be noted is that when in the summer months the temperature ranges in the high seventies or eighties, and the humidity is great, if you use a slab at 60° F., as the dew point is above that figure you will have precipitation of moisture on it, a serious impediment to the proper mixing of cement of any kind, and an absolute barrier to the successful mixing of silicate cements. The latter demand the exclusion of moisture till after crystallization is complete.

Dr. W. V-B. Ames of Chicago has worked out a simple and ingenious method of knowing when the slab is at the required temperature, and also how to keep it there. Samples of this slab can be seen in the hall.

Some operators are using the silicate cements in the eight anterior teeth in combination with gold inlays, thereby covering up the glare of the royal metal, or eliminating the black line be-

tween porcelain inlay and tooth structure, thereby producing a very esthetic result.

The gold inlay with silicate cement facing has a great possibility in future dentistry, to say nothing about the added strength it gives to the tooth, and the usefulness and permanence of the operation. The chipping of the thin edge of porcelain in said inlay is entirely overcome, by the method of combining gold inlay with silicate cement.

A few words as to how to make the inlay for the silicate facing will be appropriate at this time. Make the wax model just as you would for the average gold inlay, and just before removing the wax from the cavity take a sharp pointed instrument, and mark in the wax model just where you want the silicate cement to come, being sure to preserve the incisal edge of your wax model. Now remove the wax model from the tooth cavity, and mix some of Dr. Taggart's investing compound just as you would for investing an inlay, and invest the wax model, leaving the part of it exposed where you have already marked it for the silicate facing. After the investment has set you can take it in the hand, and with sharp instrument or suitable bur carve out the cavity in the wax inlay which is to hold the silicate cement filling in place.

Always be sure to protect the incisal edge of wax model, so that when the inlay is cast, you have the gold on the incisal edge of the inlay for strength and protection to the silicate facing.

After finishing this the model is ready for the sprue. Be careful not to mar any edge when you insert the latter. Put your invested wax model in a glass of cold water for ten minutes, no more, no less. It is then ready to be invested and cast in the usual manner.

Before concluding this paper we wish to consider some details in regard to the mixing and manipulation of the Oxyphosphate of Zinc cements.

In the mixing of any oxyphosphate of zinc cement it is essential to have a clean smooth mixing slab, and a clean spatula of proper form and size. The slab may be of glass, agate or of any glazed porcelain or other earthenware, with a smooth hard surface which will not grind off in the mixing. For all intents and purposes glass answers admirably. The spatula may be of steel

or German silver, the latter preferable, as German silver is less liable to corrosion when in contact with the free acid in the mix, and if ground into the mix is less likely to produce discoloration of the cement.

Where any discoloration which may occur by the use of a metal spatula is objectionable, as in setting porcelain jacket crowns, or porcelain inlays, an agate, bone, or ivory spatula, may be used to advantage. The agate is the best of the three, as it does not wear off into the mix as the softer bone or ivory may.

When about to make a mix, the powder and liquid should be placed on the slab, far enough apart so that a small portion of the powder may be separated from the main mass, and drawn into the liquid and thoroughly mixed before a second portion of powder is added.

The first three or four additions of powder should be thoroughly mixed after which the succeeding additions may be made, and spatulated only enough to insure a homogeneous mass, and until the desired consistency is reached.

Care must be exercised that each addition of the powder is thoroughly incorporated before the succeeding mass is added, and that no unmixed or half mixed portions be allowed to remain on the border of the mix to be later drawn into it, and cause a lumpy or clotty condition.

The too rapid addition of powder to liquid, and insufficient spatulation may cause too rapid setting with the generation of a great excess of heat, while overspatulation will produce so much of the normal phosphate that the setting will be retarded or prevented altogether.

The best results are to be obtained by mixing oxyphosphate of zinc cements as outlined above, and practically the same consistency should obtain in setting inlays, crowns and bridges. As much powder should be incorporated as possible to obtain a consistency which will allow the placing of the inlay, crown, or bridge, as the case may be.

If a hydraulic cement is used, care need not be exercised as to excess moisture after the work is placed, as the cement will set more satisfactorily with moisture, than without, while the cements which are non-hydraulic must be kept dry until thoroughly set.

In conclusion let us say that this commonplace operation of mixing cements demands more attention to detail than it often receives, and while we believe that there is no operation in dentistry, in which a full measure of success can be obtained without absolute attention to detail there is certainly no place where this saying is more true than in relation to the care and detail demanded in the manipulation of the Silicate cements.

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FULL DENTURE CLINIC.

The object of this clinic on *full dentures* is to illustrate the important steps necessary to be executed in occluding teeth anatomically. Assuming that suitable casts of the two arches have been secured, the steps are as follows:

To these two casts base-plates of metal, vulcanite or some rigid material are accurately conformed and trimmed to correct peripheral outline.

On each base-plate a rim of wax is built about three-eighths inch wide and of such depth as to represent approximately the length of the lost natural teeth. The labial and buccal surfaces of the rims are shaped as nearly as may be at this time to represent the general forms of the dentures. The occlusal surfaces of the rims are first formed flat but later must be curved to correspond with the pitch of the condyle paths.

These base-plates when adjusted to the mouth and when properly contoured are called "wax contour models."

DEVELOPING THE WAX CONTOUR MODELS.

At the second appointment with the patient the base-plate with rims attached are introduced into the mouth. The following steps are carried out:

First, the correct length of the wax rims is determined and developed by reducing or adding to the occlusal planes as the pose of the lips and length of face indicate. Additions of wax to or removal from the labial and buccal surfaces of the rims establish correct facial contour and profile.

Second, the medium line of the face is marked on both upper and lower rims.

Third, the high and low lip lines are marked to indicate the length of teeth suitable for the case.

These steps having been carried out, the base-plates now represent and are called "wax contour models," since they serve as patterns or models from which something like them in general form is to be constructed, viz., the contoured dentures.

LOCATING THE CONDYLE ENDS.

The index finger is placed on the side of the face one-half inch in front of the external auditory meatus, and on a horizontal plane with its upper margin. The patient is instructed to open and close the mouth a number of times. Careful attention on the part of the operator will enable him to determine the exact point of rotation of the condyle end. This point is marked on the integument with chalk or a soft pencil on both sides of the face and indicates the position for placing the condyle rods of the face-bow when it is later applied. The upper contour model is now removed, the bite stem heated and inserted at about one-eighth inch from the occlusal plane. The general direction of the stem should be parallel with the occlusal plane. After forcing into the rim it is removed until the bite is taken, as its weight interferes with the stability of the upper contour model during this step.

TAKING THE BITE.

One of the most difficult steps in general practice is to locate the antero-posterior relationship between the mandible and the maxilla when the condyles are at rest in the glenoid fossae. This

step is ordinarily called "taking the bite." The bite-plates determine the correct perpendicular relationship.

It has been found that by tiring the masticatory muscles they tend to draw the condyle heads backward and upward* in their respective fossae. By having the patient open and close the mandible a number of times rapidly regardless of the manner of movement and finally applying light pressure on the point of the chin, the correct relationship can be established. The lips should be parted and the relation of the upper and lower wax contour models noted during the opening and closing of the mandible.

The upper and lower contour models are now firmly attached together with bite locks, one on either side and one anteriorly. These should be placed in such position as not to interfere with the adjusting of the face-bow-stem, the position of which is indicated by the groove in the upper wax rim previously made.

APPLICATION OF THE FACE BOW.

The face bow is one of the most essential appliances in anatomic procedures. By its use the correct relationship between the alveolar planes of the mouth and the condyles when at rest in the glenoid fossae is determined and the wax contour models are transferred from the mouth to the occluding frame so that the alveolar planes of the casts when mounted, will bear a similar relationship to the frame hinges. The teeth when mounted on wax contour models will thus be placed approximately the correct radial distance from the rotation centers of the mandible so that the cusps of the lower teeth may traverse from side to side in lateral movements without interference.

The bite stem of the face bow is inserted in the place previously made for it in the upper wax contour model, and luted securely with a hot spatula.

The central clamp of the face bow is passed over the rod of the bite stem and the terminal end of the bow carried backward until the condyle rods are opposite the points previously marked on the face. The rods are pressed in until in contact with the face, care being taken to have the same number of gradations showing between the inner sides of the bow and the face. The clamps on

the condyle rods are now tightened. Care should be taken to see that the ends of the rods have not dropped or drawn the integument below the condyle ends. The operator should hold the rods in position while the assistant or patient tightens the clamp of the bite stem.

TRANSFERRING THE WAX CONTOUR MODELS FROM THE MOUTH TO THE OCCLUDING FRAME.

The clamps of the condyle rods are now released, the rods are drawn out, the patient instructed to open the mouth and the contour models attached to the bow are removed.

The condyle rods are now moved in full length and the clamps tightened. The occluding frame is placed on the tin base, its lower bow engaging with the lugs of the latter to prevent the frame tipping while mounting the casts. The upper bow of the occluding frame is raised and thrown backward, the face bow sprung apart sufficiently to allow the condyle rods to engage with the projecting lugs of the frame hinges.

The face bow is leveled up parallel with the bench on which the frame rests. This is done by placing a block of suitable thickness under the central clamp.

MOUNTING THE CASTS ON THE OCCLUDING FRAME.

The upper cast is adjusted in the upper contour wax model and luted with wax if necessary to prevent displacement. The upper bow is brought forward and down on the base of the cast and attached with plaster. When set, the entire frame is inverted, the lower bow thrown back, the lower cast adjusted in the base plate, the bow dropped down upon its base and the two attached in a similar manner to the upper.

When the plaster has set the face bow and bite locks are removed and the case is ready for the next important step.

REGISTERING THE CONDYLE PATHS OF THE PATIENT.

The metal bite gauges are inserted in the occlusal surface of the lower wax contour model, about three-quarters of an inch in front of its distal terminals. They are so placed as to prevent the sliding forward and tipping upward anteriorly of the lower contour model in the step which follows. The patient is now instructed to

protrude the mandible. The amount of protrusion should be not less than one-eighth nor more than one-quarter of an inch, otherwise an incorrect registration may result.

While in the protruded position the mandible should be closed with sufficient force to imbed the bite gauges in the upper wax rim and bring the incisal surfaces of the contour models in contact anteriorly.

The bite locks are now inserted in the wax rims one on either side and one anteriorly, and the contour models removed from the mouth.

The declination forward and downward of the condyle paths is thus registered in this manner. The bite locks maintain the peculiar relationship of the base plates to each other as produced by the travel forward and downward of the condyles in their paths.

SETTING THE CONDYLE PATHS OF THE OCCLUDING FRAME.

The clamps controlling the condyle paths of the occluding frame are released, the back spring unhooked, and the lower and upper casts are carefully seated in their respective base plates. Care should be taken to apply pressure through the center of the casts only, to prevent tipping, otherwise an incorrect relationship will result. Undue pressure on the casts anteriorly increases and posteriorly decreases the condyle pitch of the frame slots.

When the casts are correctly adjusted, each slot plate is moved lightly up and down to insure its being free from impingement of the hinge pins after which the condyle clamp is tightened.

The bite locks and gauges are now removed and the back spring attached. This brings the contour models into their original antero-posterior and perpendicular relation to each other, the pitch of the condyle paths of the frame only having been modified by the taking of the protrusive bite.

DEVELOPING THE COMPENSATING CURVE.

Throughout the procedures up to this point the occlusal planes of the contour models have been flat. To compensate for the dropping down of the condyles in their forward movements, these flat planes must be curved so as to remain in contact in the lateral movements of the frame. It is particularly essential that contact be

secured in lateral movements in the region of the second molar teeth, since these teeth afford balancing contact in masticating effort.

The pitch or inclination of the occlusal planes in this area should represent short cords or tangents of curves parallel to or continuous with the condyle paths. This curve may be developed by various methods.

The most convenient procedure is to project a line parallel with the condyle slot on the wax rims and bisect the included angle formed by its junction with the occlusal plane.

This line will give the correct pitch of the occlusal plane in the area to be occupied by the second molars. Anterior to the second molars the line is carried forward in a pleasing curve and merged with the incisal plane just anterior to the cuspids. When the pitch of the condyle path is pronounced the wax plane on each side should slant downward and inward from buccal to lingual also at about the same inclination as the wax plane slants in the second molar region.

ARRANGING THE TEETH.

The full upper denture should be arranged first beginning with the central incisors and working backward in natural order to the second molars.

The lower second bicuspid are next placed in position and tested for both full and partial occlusion, grinding the high points if necessary to secure close contact. The order of procedure after the bicuspid are placed is as follows: first molars, second molars, first bicuspid, cuspids, laterals and centrals.

When occluded, the application of carbon paper between the occlusal surfaces will disclose the high points. These should be reduced by grinding until close interlocking of the lower with the upper bicuspid and molars is effected, in both full occlusion and lateral movements as well.

When occluded, contoured, and festooned, as the finished denture should be, they are called "wax model dentures."

To prove occlusion and esthetic effects, the wax model dentures should be tested by trial in the mouth. Any necessary changes can be readily effected at this time and such trial may obviate the entire reconstruction of the case.

When finished, the contact of the teeth in full occlusion and in the radial swing of the mandible is again tested with carbon paper. Points of interference are thus disclosed which should be removed with engine stones.

This step corrects any discrepancy which may exist between the radial swing of the occluding frame on which the teeth were occluded, and the natural rotation centers of the mandible which will hereafter guide the lower against the upper teeth in masticatory effort.

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PARTIAL DENTURE CLINIC.

There is no service rendered by the dentist more exacting than that of partial denture construction in its many phases and it is with this idea in view that we are giving a composite clinic hoping to create a better understanding of this branch of our work.

If we have in mind the conservation of the remaining natural teeth as regards mutilation in construction and damage while being worn, the problem of how best to supply the missing teeth in the great variety of cases that come to us for treatment is indeed an important one worthy of our best judgment, careful study and painstaking workmanship.

It is our belief that improperly constructed and injudiciously placed partial dentures have resulted in the loss of more teeth than any other operation that we are called upon to do. And we believe that much of this tooth loss can be avoided by an observance of a few principles.

Since every case that presents for treatment is a law unto itself we must make a careful study of each one in order that we may employ the correct appliance. To choose between fixed bridges, removable bridges and partial plates is sometimes very



Fig. 1. Plaster impression showing Modelite packed in impression of teeth to be clasped and screws set preparatory to pouring the plaster cast.

difficult, and the operator who is familiar with the possibilities of each will surely render the best service to his patient.

The fixed bridge has its place and when properly made and placed has no equal for comfort and service, but the time has come for us to be more careful in their employment. The maintenance of a sanitary and healthful condition of the mouth is today imperative. And to meet this requirement we must make more removable bridges and partial plates.

The first essential in the construction of a successful partial denture of any sort is a good impression. They may be taken in either plaster or compound; conditions will govern the choice. The plaster impression should be allowed to harden in the mouth



Fig. 2. Plaster cast showing Modelite reproduction of teeth to be clasped. Continuous loop clasp on left bicuspid and open loop clasp on right cuspid. Also proper position of lingual bar and upright spurs for vulcanite attachment.

so that it can be broken out in sections and the parts reassembled in the tray. Compound impressions should be taken in sections in most cases, otherwise the drag around the teeth will produce a distortion that is intolerable. We must have accurate impressions of the teeth to be clasped.

Models should be made of plaster excepting the teeth to be clasped which should be made of some hard substance that will resist the heat of soldering and vulcanizing and mutilation while fitting the clasp. Modelite serves this purpose best though a slow setting cement may be used.

The Modelite or cement should be mixed to a stiff putty consistency and packed into the tooth to be clasped and the one adjacent. A wood screw is placed before crystallization takes place, allowing the head to project for anchorage in the

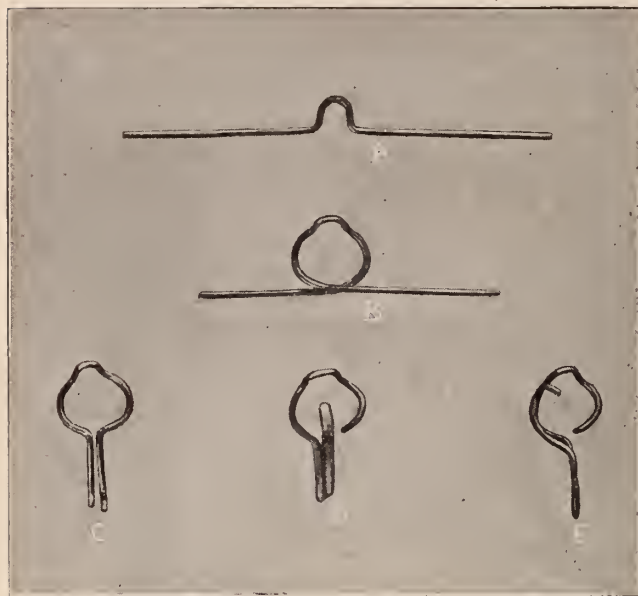


Fig. 3. Showing formation steps and three types of completed loop clasps.



Fig. 4. Royce clasp. An improved form of band clasp. The gingival slits greatly increase the flexibility, adaptability and efficiency of the band form of clasp.

plaster which forms the remainder of the model. (Fig. 1.) Location, conformation and condition should determine what teeth are to be clasped and the form of clasp or attachment to be used.

Teeth to be used for anchorage in any form of clasp or attachment should be in a healthy condition and so located that the plate with whatever form of clasp or attachment is made there will be the least possible leverage exerted upon it. Wide band clasps should be employed on crowned teeth only. Some form of wire clasp should be used in clasping the natural tooth. The great variety of forms into which the wire can be shaped makes it possible to successfully clasp any tooth that can be

clasped with the band clasp and its efficiency has been proven in many cases where the band clasp would not work at all. The wire loop clasp is also less liable to induce decay of the clasped tooth. It is more flexible yet grips the tooth tighter and is less

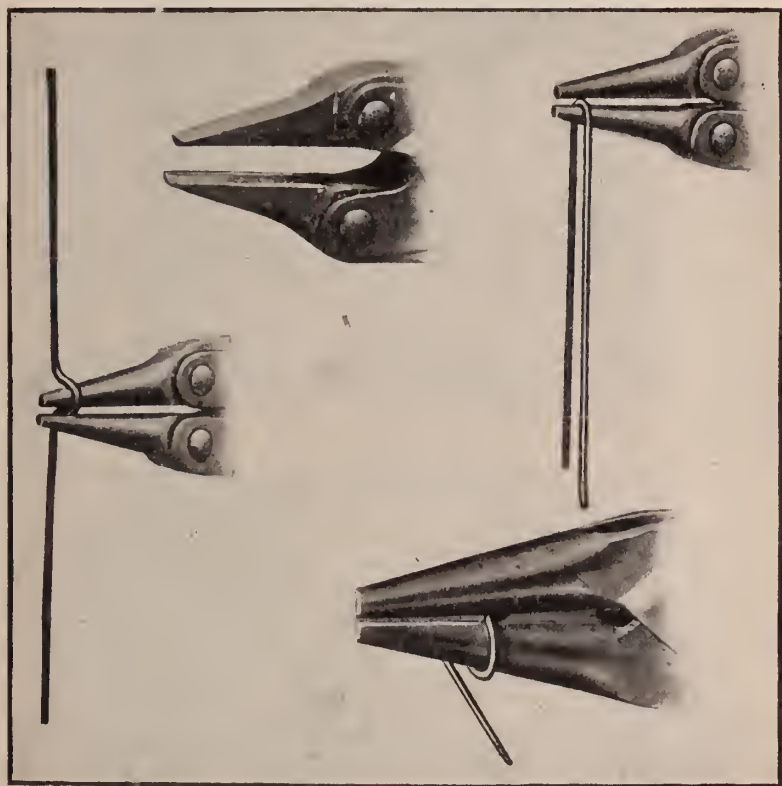


Fig. 5. Pliers used in forming loop clasps. The small, round nose pliers are very useful in making the three short bends in the wire which constitutes the vertical bow. The vertical bow is then grasped between the beaks of the large round nose pliers and the ends bent around the lower beak, thus forming the labial and lingual horizontal spans. The concave-convex pliers are employed in perfecting the adaptation of clasps to the various sizes and shapes of teeth.

conspicuous in the mouth. The continuous loop (Fig. 3-C) affords a very rigid grip on all sides of the tooth and is therefore particularly adapted for clasping the cuspids and all other cone shaped, straight sided, or short teeth. The open loop (Fig. 3 D-E) is more flexible and is especially adapted to clasping

bell shaped teeth. Loop clasps may be tightened by compressing vertical bow.



Fig. 6.



Fig. 7.

In making the loop clasp the first step is to bend the wire making the vertical bow (Fig. 5 A-B). The vertical bow is then held in large pliers while the free ends are bent around



Figs. 6, 7, 8. Typical plate outlines for upper partials, avoiding lingual contact with remaining natural teeth.

lower beak forming the labial and lingual spans, thus completing the general form of clasp (Fig. 5-C). The further accurate adaptation is best accomplished with a concave-convex beak



Fig. 9. Alveolar bars with vertical pins over which saddles connected with lingual bar is fitted. A splendid means of supplying partial dentures when indicated.

pliers (Fig. 5-D). The terminals are bent back over the ridge to the lingual where they are attached to the denture (Fig. 3-C). The open loop is made by cutting off the labial terminal and bending the lingual terminal back upon itself, soldering it to the lingual horizontal span (Fig. 3-E). Occlusal rests may be made by continuing the lingual terminal up over the occlusal surface of tooth at some favorable point (Fig. 3-E) or by soldering an extra piece of wire to the terminals as in Fig. 3-D.

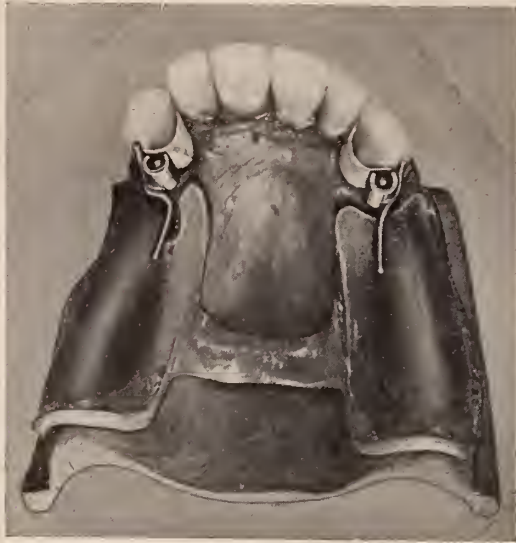


Fig. 10. Partial upper showing proper plate outline with Roach attachments on cuspids (Goslee crowns). Note the importance of wire spur running up to contact point on cuspid crowns.

SUGGESTIONS.

Use high per cent platinum and gold alloy (clasp gold) round wire of 20-gauge for the continuous loop and 18-gauge for the open loop.

When making short, abrupt bends in the wire it should be well annealed and bent over the round nose pliers.

The spring can be restored to the wire by rubbing vigorously with a flat burnisher.

Do not allow the clasp to impinge upon the gum or to rest on the tooth below the enamel.

Provide against settling of clasp with occlusal rests or by grinding a slight shoulder just above the contact of the adjacent tooth. This grinding will sometimes be necessary to provide space for the passage of the vertical bow.



Fig. 11. Shows steps in attaching the spur to tube of Roach attachment.

When doing any soldering in connection with these delicate wires great care will be necessary to avoid burning. Unless one is quite expert the clasps had better be invested and nothing higher than 18K solder used.



Fig. 12. Shows alveolar bar soldered to copes on cuspid roots and extending slightly beyond on both sides for the anchorage of the Gilmore attachment.

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FIXED BRIDGE-WORK.

In the construction of "fixed" bridgework, the great law of variation enters so prominently into each case, and the requirements of individual cases are in turn so diversified, as to practically preclude the adoption of specific rules. For this reason it is apparent that no special methods, nor modes of procedure, may be classed as universally applicable.

Hence, since this particular field of effort, as now practiced, is comparatively modern, we cannot be guided altogether by the advantages which might be derived from an extensive experience, but on the contrary, must depend to a large extent upon close clinical observation combined with the intuitive or acquired genius of a practical mind and hand, so trained as to work in consonance, for the application of such principles and methods as will seem to be indicated, and to offer the most favorable opportunity for achieving successful results.

Thus it will be observed that the successful application of any form of dental bridge, and particularly of a "fixed" type, is, first, altogether a matter of judgment, a faculty which may be acquired or developed by observation and study, while success or failure in so far as pertains to the construction will depend largely upon the display of skill, or lack of it, in the execution of detail.

This faculty of good judgment may be best acquired by first obtaining a knowledge of the correct principles, and then closely observing the successes and failures as they present from time to time, and by studying the cause and effect of each respective result, a duty which every conscientious operator essaying to do this class of work owes to his profession, to his patient, and to himself.

The cases shown in this clinic are of the individual clinician's own design, and typify his ideas as to methods of attachment and features of construction, but a somewhat unique and signal feature lies in the fact that in all cases presented the use of *replaceable* or *cemented* porcelain teeth, or facings, of some type, is religiously adhered to, no teeth or facings used being attached by means of soldering. The clinic therefore will demonstrate the use of interchangeable and replaceable teeth in "fixed" bridge-work exclusively.

Because of the frequency with which porcelain teeth and facings which are attached to the supporting structure by means of soldering become fractured, either during the process of soldering or under the stress of mastication subsequently, the more or less general use of "replaceable" or "interchangeable" teeth which are attached by means of cementation only is rapidly becoming a standard practice, and one which is recognized as the safer and better procedure by those who are most expert in crown and bridge-work. There is no question but that work so constructed possesses many advantages, chief among which are the decreased likelihood of breakage or fracture, and the facility with which repair or replacement may be effected in the event of such mishap.

The decreased likelihood of fracture, in the first place, is due to the fact that the porcelain teeth not being heated at all are naturally used in their strongest possible form; and, secondly, the influence of the expansion and shrinkage of the metals and solders used in the process of construction, which often accounts for fractured teeth and facings, is avoided; and, furthermore, when the attachment is made with cement the teeth are less likely to become fractured in the mouth because of being held less rigidly and of being better cushioned and protected.

For these reasons it is evident that this method of procedure must ultimately become a general practice.

In the use of replaceable or interchangeable teeth, their removal from the supporting structure after they have been cemented to place may frequently be desirable or become necessary for various reasons. Whenever this is indicated, any of the forms now used may be easily removed by placing the piece in nitric acid and allowing it to remain for several hours, or until the cement has been dissolved. This will permit of their ready detachment without injury to either porcelain or gold.

Also, in all cases where for any reason it may become necessary to subject the piece to the heat of soldering after the teeth have been cemented, each and every tooth should always be detached and recemented before mounting the case.

This procedure is absolutely necessary, because the heat of soldering will disintegrate the cement, and no matter how securely and firmly attached they may seem to be when the case is

removed from the investment, it is but a question of time until the action of the mouth fluids upon the already disintegrated cement will cause them to become loosened or detached.

As a safe precaution, therefore, whether it be a new case in which some change has to be made before mounting, or an old one which is to be repaired, if it must be heated and soldered after the teeth have been cemented, then as soon as the soldering has been accomplished the piece should be placed in the acid bath and allowed to remain until each and every tooth may be removed, after which they should be recemented. Nitric acid, however, being a solvent of German-silver and other nickel alloy posts and dowels, when these have been used in the work, 20 per cent sulphuric acid should be used instead. This takes a longer time, but is equally effective.

This applies to any of the various forms of replaceable porcelain teeth which are cemented to the supporting structure.

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THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science,

PUBLISHED MONTHLY.

EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

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EDITORIAL.

THE STATE BOARDS.

The State Boards of Dental Examiners throughout the country have no easy function to perform. The situations with which they are confronted are often exceedingly trying. They are the buffer between the people, the profession and the hordes of would-be illegal practitioners who are constantly watching for a broken bar or a hole in the fence. They are blamed by the ultra stringent for not sufficiently enforcing the laws, and equally blamed by others for enforcing them too rigidly. They are damned if they do, and damned if they don't.

And it is in the very nature of things that this should be so. To the men who are safely housed in the folds of the profession there very naturally seems no good reason why the lines for admission should not be drawn tightly. To the men on the outside who are desirous of getting in it seems a hardship to have the last jot and tittle of the law enforced. The whole thing is simply a different point of view. And the board is the butt.

Men seldom stop to reason that when a board takes a certain stand on any question they are simply carrying out the law which they are sworn to enforce, and that if there is any criticism it should be of the law and not of its administrators.

To be sure there have been inefficient men on the boards who did not administer the law well, and there have even been dishonest men who did worse than that. But this is no isolated instance in human experience. There have been bad men in every activity of life—even ministers of the gospel have committed more heinous

crimes than ever were attributed to a member of a dental board. The wonder is that more bad men have not gained membership on boards when we consider the number that have been appointed and the system under which appointments are made. Paradoxical as it may seem, the most constant thing about the personnel of a board is its every varying changes.

And this introduces the chief handicap to the average board, viz., its lack of experience. The astonishing thing is that more mistakes are not made than there are when we consider the short service of most members of boards. In professional educational work men serve year after year—in many instances a quarter of a century,—and they become familiar with the work and are better able to meet emergencies than would a new man who lacked experience. And yet we expect as much of a member of a board who has been in office only a year or two as we do of the college professor who has been in harness nearly all his life.

The boards need our support and encouragement instead of our censure. We should hold up their hands in the administration of all just laws, and if laws are not just they should be repealed, and other and better laws placed on the statute books. If members of boards deliberately do wrong and misuse their office they should be severely punished. They should be held to the strict observance of their oath which they took when they assumed office, and no quarter should be given them in view of the nature of their obligation and the seriousness of any violation of this obligation. But when they honestly try to do their duty, even though at times they may err in judgment, and make mistakes, we should not be too punctiliously critical of them or take them too seriously to task. We should always remember that they are human, and instead of discrediting their work we should support them in every legitimate way in performing their functions.

These remarks are prompted by a conversation recently held with a member of the profession who was criticising a certain board for not admitting a candidate to license after practicing a number of years in another State. The question of reciprocity was not up. The candidate stood for examination and was rejected, and immediately the charge was made: "That board turned this man down because they did not want to have him practicing in competition with them. They were afraid of his ability."

Such a statement in connection with this particular board was puerile beyond imagination. They were all men of high ideals, and they were broad minded enough not to consider for a moment the possible effect on their individual fortunes of admitting one more man to practice in a state where there were already nearly 4,000 practitioners. It is in just such unwarranted statements as this that great prejudice has been developed against boards, and much harm and injustice has resulted; and it is high time that they cease and that boards be given the same consideration that other ordinary human beings are supposed to possess.

THE EDITOR'S DESK.

WANTED—A SENSE OF INTEGRITY.

What the world needs more than anything else at this time is a higher appreciation of the virtue and value of integrity. Men skim along day after day on the ragged edge of dishonesty, content only if they can keep within the letter of the law while flagrantly violating its spirit. The fundamental basis of true success is honesty, but there seems to be an impression abroad in the land that this old-fashioned statement is out of date. Sharp practice seems to be the watchword of the hour, and there are men in the world—many of them—who apparently believe that this is necessary in order to get ahead in life. The grocer gives short weight, the butcher misrepresents the kind of steak he is selling, the dry goods man palms off an inferior article, the carpenter puts rotten lumber in your building if he thinks he can hide it from view, the painter uses an inferior quality of paint and charges for a good quality, the laundress puts chemicals in the wash to make her work easier and ruins your clothes, the cook connives with the delivery boy to rob you, the butler breaks your choicest dishes and surreptitiously flings the pieces in the garbage can, the grafter lies in wait for you in every relation of life from the politician who steals the taxes you pay to the waiter who works you for a tip—it is graft, graft till the hydra-headed monster has crept into all pursuits. The labor unions are saturated with it and some of their leaders unblushingly levy tribute from helpless builders and manufacturers in a

way that would put to shame the boldest buccaneer of ancient days. The big corporations reek with it, and even the professions are not exempt. The shyster lawyer connives with a willing victim to trump up a case against a reputable citizen and takes it to court on a contingent basis. The surgeon—worst graft of all—pays a commission to the general practitioner for referring cases and then cuts up people who would be infinitely better without the knife. The dentist dupes the ignorant with the lure of “whalebone” teeth, “painless dentistry” and “four dollar crowns,” getting the victim to the office and then squeezing every penny from him by all sorts of subterfuge.

Everywhere, into all avenues of effort, the game of wits has entered without the leaven of a basic and fundamental honesty to preserve the equity of things and give the affairs of life stability. And what is the result? Look at the business world. It is said that more than 90 per cent of business men fail or go bankrupt at some period of their career. This is of course not in every instance due to dishonesty, but it is safe to say that the vast majority of cases of failure may be traced directly or indirectly to questionable methods. The fault may not be personally in the man who fails, but somewhere in the conduct of his affairs there is a false standard to account for the failure.

If we look carefully into the history of those great mercantile and manufacturing concerns which have stood out as signally successful during an extended period of time we shall find that their methods have been based on the strictest integrity in dealing with the public. Instances might be mentioned by the score of houses of national and international reputation which have stood the test of money stringency and panics, serene in their solidity and secure from waves of business depression and external turmoil. In every case their chief asset is the reputation gained for honest methods which has made them financially strong.

And what is true of concerns is true of individuals. The greatest asset any man can have is a reputation for sterling integrity, and this fact should more and more be impressed on the youth of our land. The world needs men of honesty today as it never needed them before, and there is a greater premium on it. The boys and girls of the present should be taught by precept and example that

the chief aim in life is to adhere to the strictest line of correct living, that this kind of life brings its ample reward, while any deviation from it inevitably brings its penalty. To have ingrained in the mind of a youth this one principle is equivalent to giving him a liberal education—without it his education is never complete.

BOOK REVIEWS.

PRACTICAL ORAL HYGIENE, PROPHYLAXIS AND PYORRHEA ALVEOLARIS. By Robin Adair, B. S., M. D., D. D. S., Professor of Oral Prophylaxis and Pyorrhea Alveolaris, Southern Dental College, Atlanta, Ga.; Oral Surgeon, Grady Hospital (1910-1912); Member Fulton County Medical Society, Georgia State Medical Society, Georgia State Dental Society, National Dental Society. Byrd Printing Company, Atlanta, Ga.

Dr. Adair's devotion to the subject which forms the title of his book has long been known, and when it was announced that he would bring out a volume on this topic it was looked forward to with the assurance that it would contain the essence of the subject to date. He has freely and frankly drawn from the writings of every man who has added to the knowledge of the subject, and the result is a book filled with the best there is in dental literature dealing with oral hygiene. The book contains 327 pages and every page is interesting in its way. The prime object of every book should be to create a profound impression on the reader regarding the subject matter of which the book treats, and in this respect the present volume measures up to the full expectancy of the author. No one can read this book carefully and lay it aside without being notably impressed with the significance of the various subjects of which it treats, and this is the highest recommendation any book can have. In future editions it is hoped that the typographical features will be relieved of some of the mistakes which have crept in—due undoubtedly to a hurried preparation at the last moment. We bespeak for the volume a careful reading, with the hope that it may do great good and result in the better care of our patients so far as the hygiene of the mouth is concerned.

FIRST AID DENTISTRY. By E. P. R. Ryan, First Lieutenant Dental Surgeon, U. S. army. With eighty illustrations. Pages, 153. Price, \$1.25 net. Published by P. Blakiston's Son and Co., Philadelphia, Pa.

The author of this little volume states in his preface that it "has been designed for medical and dental practitioners and students, for nurses, and especially for hospital corps men of the military and naval service, and for all who are called upon to administer relief from dental pain, where the services of a dental surgeon cannot be obtained."

In the main it deals mostly with emergency work, and it will prove a very useful volume, not only for those engaged in the army or navy service, but for all who are so situated that they are likely to be confronted with the emergencies which are likely to arise from dental disorders. A few of the subjects treated will give an idea of the nature of the work: "Septic Conditions of the Mouth," "Salivary Deposits," "Inflammation of the Mucous Membrane of the Mouth," "Syphilis in the Mouth," "Dental Pain," "The Treatment of Pulpitis," etc., "Neuralgia," "Pyorrhea Alveolaris," and such subjects as fractures, extractions, diseases of the maxillary sinus, etc.

This volume is worth much more than the price charged for the many valuable suggestions made therein.

DISEASES OF THE HEART. By John Cowan, D. Sc., M. D., F. R. F. P. S., Professor of Medicine, Anderson's College Medical School; Physician, Royal Infirmary; Lecturer in Clinical Medicine in the University of Glasgow; Examiner in Medicine, Royal Army Medical College. Octavo, 458 pages, with 199 illustrations. Cloth, \$4.00 net. Lea & Febiger, Publishers, Philadelphia and New York, 1914.

The dentist is becoming more and more interested in diseases of the heart. Incidentally to the administration of an anesthetic whether general or local, it is of importance to be able to determine the condition of the heart. Nitrous oxid is being given everywhere, and local anesthetics are being injected very extensively by the profession. Too frequently this is being done without a clear

conception of the possible danger or the knowledge to determine if there may be danger.

Not only this but the relationship between oral sepsis and certain heart affections is being more clearly determined, and dentists and physicians are becoming more alert as to the dangers of allowing mouth infections to develop or continue. This book should be read by every dentist and some of the chapters should be carefully studied. In one place the author, recognizing the significance of oral sepsis, says, speaking of a patient suffering from acute endocarditis: "His mouth was extremely septic, the gums being swollen and bleeding on slight provocation. A similar state of extreme oral sepsis was present in another patient." We commend the book.

PRACTICAL HINTS.

Edited by J. E. Schaefer, D. D. S.

(This department is for busy readers. We want short articles containing practical hints—the shorter the better. No article must exceed 200 words, unless of exceptional merit. Every dentist has some useful hint that has been of value to him, and if he will only put it in print it may be of equal value to others. That is what this department is for. Due credit will be given for every article sent. Address J. E. Schaefer, 1745 W. Harrison St., Chicago, Ill.)

Separating Bicuspid:—A very convenient way of separating bicuspid and molars for shell crown of the left lower and right upper side is to use a left handed screw mandrel.—*Dr. Chas. H. Wachter, Girard, Ohio.*

Mixing Synthetic Cement:—After a mix of synthetic has been obtained, of proper stiffness and consistency, gather it quickly in a ball on the slab and tap it gently several times with the agate spatula. This will develop a fine homogeneous consistency.—*Arthur G. Smith, D. D. S., Peoria, Ill.*

Difficult to Grind with Plates:—Why patients wearing artificial teeth, and especially on flat lower jaws, find it so difficult to chew tough meat is because it requires grinding and except in favorable conditions, and the flat jaw is very unfavorable, grinding

is impossible. The movement is simply up and down. Then of what value is the "three point contact"?—*L. P. Haskell, D. D. S.*

Application of Arsenic to Shallow Cavities:—Apply rubber dam or use cotton rolls. Remove all decay; wipe out cavity with carbolic acid. Take an excavator and apply arsenic paste over the pulp-chamber. Now take a piece of asbestos paper, about 27 gauge, and cut it to fit over the arsenic paste, then cover with cement. By this method you will avoid trouble for yourself and pain for your patient as the arsenic is prevented from getting out on to the gum tissue.—*Chas. H. Wachter, D. D. S., Girard, Ohio.*

Banded Crowns:—Those who still use the full band claim as its advantages,

1. That it prevents labial displacement of the crown.
 2. That it prevents the splitting of the root.
 3. That it more effectually protects the end of the root, by preventing disintegration of the cement.
 4. That it affords a stronger, more stable attachment of the crown to the root.—*A. W. Thornton, L. D. S., Montreal, Canada.*
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Distortion of Wax:—Distortion from elasticity of the waxes can be minimized to an imperceptible degree, by using a non-plastic inlay wax. By this we mean a wax that at ordinary temperature of the mouth becomes sufficiently hard so as to be removed without chilling to a sub-normal degree. Distortion due to elasticity is always due to the wax being allowed to regain a temperature that is warmer. Evidently the sudden chilling of wax causes a molecular arrangement which when this wax becomes warmer gives it a tendency to return to the state or form it was when melted.—*L. C. Burgard, Louisville, Ky.*

Pulp Nodules:—These are calcific bodies of varying shapes and sizes, supposedly the result of secretion, and occurring within the pulp, and are rarely, if ever, attached to the dentin. They are found more generally in middle-aged or elderly patients whose teeth have been subjected to such continued irritation, the source of which was mentioned as an etiological factor in the formation

of secondary dentin. Black, however, observes that pulp nodules may, and frequently do, form in other teeth of the same denture which are not directly involved in the irritation; and that irritation of the pulp of one tooth very frequently causes a general hyperesthesia of the pulps of all the teeth in that mouth, especially is this true of that type of individuals classed as neuralgic.—*J. P. Buckley, D. D. S., Chicago, Ill.*

How to Fill Root Canals:—A sense of pressure noted by the patient will determine whether the filling has reached the apical foramen (which must be by a slight sensation of pressure), but we must also be able to determine whether this pressure is from the filling or air. First, apply the rubber dam and dessicate the root canals. Second, flood the pulp canal with chloroform and by the movement of the broach back and forth in the canal air bubbles will escape. Afterwards work chlora-percha in the canal. A new danger arises here, i. e., in the act of removing the broach, air will rush into the pulp canal. This can be avoided by seizing the broach with pliers and drawing the broach slowly out, leaving gutta-percha in its place. Then follow with the gutta-percha point, forcing the latter gently till a slight pressure is noted.—*Dr. Woolley.*

When to Fill Root Canals:—Too much time is spent in the treatment of teeth. I always fill root canals at first sitting, when in my judgment there is no complication with tissues beyond the root to be filled. A careful study of the literature I think justifies this. But few men say as much. Their reasons for delay are not consistent, and clinical experience does not prove the wisdom of delaying. My method (not original) is to remove the pulp and flood the canal with phenol, wipe out with cotton on broach and moisten canal with chlora percha, then insert a gutta-percha point. If a large canal, nip off the point and dip in the chlora percha to avoid having a sharp point in the apical tissues.

I have followed this method for ten years. Very carefully at first, a bit more daring after the Edmund Kells paper before the Chicago Dental Society. Till now it is my every day practice. *There is no good reason for waiting; when you have the canal clean, fill it.* —*F. J. Ryan, D. D. S., Chicago, Ill.*

Detachable Post Crowns:—A better method for making detachable post crowns than I gave to the readers of the DENTAL REVIEW some time ago may be described as follows:

Fit band, cope and post (all soldered together) to root in the usual manner. In case of very short bite cut exposed part of post down flush with the cope in order to gain the necessary space for the porcelain crown. After the porcelain has been properly ground and fitted, allowing the porcelain at the cervix to extend over the band slightly so that no gold will show on the labial surface when the case is cemented to place, swage 36 gauge 24k gold to this surface of the porcelain. The swaging or burnishing will perforate the gold at the point where the post enters the porcelain. With the gold accurately fitted and adapted, make an open tube of 36 gauge 24k gold just a trifle smaller than the diameter of the hole in the porcelain but a very trifle longer than its depth. This permits the gold to be burnished to all surfaces of the opening and the extra length when burnished forms a small lip or flange over the gold surface which holds the tube in its proper relation to the gold that is swaged over the surface of the tooth. With the gold in place on the porcelain tooth fill the tube with any sponge or crystal gold. Cover upper surface of gold with sticky wax, insert match or stick in softened wax, then cover incisal edge of tooth with wax and stick in like manner, chill; separate porcelain from gold, being careful to avoid any distortion; catch gold in pliers, pass through flame and the gold will slip easily from the wax. With the wax all carefully burned off still holding the gold with pliers, feed 22k solder into the sponge gold by simply holding over a bunsen flame until it will contain no more. We now have an accurately fitting solid gold post for the porcelain. Replace gold on the porcelain crown and with melted or softened sticky wax attach the gold of the porcelain to the gold cope in the proper position. In case of a long bite the proper contouring of the assembled parts may be done with inlay wax added to the sticky wax, the porcelain removed and the work completed by the casting process. In short bites it is better to invest and solder, getting the necessary contour by adding small particles of gold plate or gold wire.

My experience with the short bite cases leads me to believe that cause of failure in attempting to cast a very small amount of gold

against two gold surfaces is, the air cannot escape with sufficient rapidity to make way for the molten gold as it does in the porous investment where there is no gold to retard its progress. My theory may be wrong but I have had a sufficient number of failures in casting to abandon that process in the short bite cases.

This method of making detachable post crowns is of course equally applicable in cases where a cope is fitted over the end of a root without band but I believe a thoroughly well fitted band is an element of strength, especially for lateral and first bicuspid roots.
—A. W. McCandless, D. D. S., Davenport, Ia.

MEMORANDA.

[Society notices will be given insertion in this department free of charge. Subsequent insertions will be charged for at the rate of \$2.00 an inch.]

WISCONSIN STATE DENTAL SOCIETY.

The 44th annual meeting of this Society will be held at Fond du Lac, July 14, 15, 16, 1914.

O. G. KRAUSE, Secretary.

BIBLIOGRAPHY OF DR. BURGARD'S ARTICLE.

Dr. L. C. Burgard wishes us to publish the following bibliography in connection with his article which appeared in our June issue. It should have appeared with the article, but through some oversight of the author it was omitted:

Price, Weston A.—The Laws Determining the Behavior of Gold in Fusing and Casting, *Cosmos*, March, 1911.

Van Horn, C. S.—A Technique Together with Appliances, etc., in Executing, etc., *Wax Pattern*, *Cosmos*, Sept., 1912.

Van Woert, F. T.—The Technique of Inlay Making by the Direct and Indirect Method. *Items of Interest*, March, May, July, 1913.

ILLINOIS STATE DENTAL SOCIETY.

Permit me to announce the election of officers of the Illinois State Dental Society for the ensuing year, and the place of meeting selected for 1915.

President, J. M. Barcus, Carlinville.

Vice-President, J. P. Buckley, Chicago.

Secretary, Henry L. Whipple, Quincy.

Treasurer, T. P. Donelan, Springfield.

Librarian, J. D. Wilson, Danville.

The fifty-first annual meeting to be held at Peoria, May 11, 12, 13, 14, 1915. I am

HENRY L. WHIPPLE, Secretary.

-REMINISCENSES BY DR. L. P. HASKELL.

Beginning in the next number of the DENTAL REVIEW, Dr. Haskell will contribute to this magazine a series of articles dealing with the conditions which existed at the time of his entrance to the profession, and with his personal experiences during his seventy years of practice.

MINNESOTA STATE DENTAL ASSOCIATION.

This year's meeting of the Minnesota State Dental Association will be a radical departure from previous meetings in several respects. It will be held in Duluth, Aug. 6, 7, 8, a season when the cool breezes of the North beckon invitingly to the vacation seeker. The clinic will be of the progressive type, which assures that every man will see every step of every clinician. The presence of such men as Knocke in removable bridge work—Prothero in prosthesis—Buell in porcelain and Weaver in pyorrhea, in addition to a number of local men, promises a meeting that the modern practitioner can ill afford to miss. There will also be a very complete manufacturers exhibit. Duluth, situated as it is at the head of the chain of the Great Lakes, gives one the privilege of numberless pleasure trips which can well be combined with the clinic as ideal vacations. The Minnesota State Dental Association and Duluth hope to have the pleasure of your company Aug. 6, 7, 8, 1914.

BENJAMIN SANDY, Secretary.

THE PANAMA-PACIFIC DENTAL CONGRESS.

The Committee of Organization of the Panama-Pacific Dental Congress is pleased to present to the members of the dental profession the following report showing the progress of the work of organization, feeling certain that a sound foundation has been laid for the greatest dental meeting ever attempted.

OFFICERS AND MEMBERS OF THE COMMITTEE OF ORGANIZATION.

Dr. Frank L. Platt, Chairman, 323 Geary street, San Francisco; Dr. Arthur W. Chance, vice-chairman, Portland, Ore.; Dr. Arthur M. Flood, secretary, 240 Stockton street, San Francisco; Dr. F. G. Baird, San Francisco; Dr. H. A. Fredrick, San Francisco; Dr. Joseph Loran Pease, Oakland, Cal.; Dr. H. G. Chappel, Oakland, Cal.; Dr. F. C. Jarvis, Oakland, Cal.; Dr. T. Sydney Smith, Palo Alto, Cal.; Dr. R. B. Giffen, Sacramento, Cal.; Dr. Charles M. Benbrook, Los Angeles, Cal.; Dr. George T. Williams, Seattle, Wash.; Dr. Geo. F. Stiehl, Salt Lake City, Utah; Dr. B. M. Brookfield, Idaho Falls, Idaho; Dr. H. H. Wilson, Phoenix, Arizona.

OFFICERS OF THE SECTIONS OF THE PANAMA-PACIFIC DENTAL CONGRESS.

Section I.—Anatomy, Physiology and Histology.—Dr. I. Norman Broomell, chairman, Medico-Chirurgical College, Seventeenth and Cherry streets, Philadelphia, Pa.; Dr. W. H. G. Logan, vice-chairman, Chicago, Ill.; Dr. Malcolm Goddard, secretary, San Francisco, Cal. *Section II.—Etiology, Radiography, Pathology and Bacteriology.*—Dr. Frederick Bogue Noyes, chairman, 122 South Michigan avenue, Chicago, Ill.; Dr. R. H. Hofheinz, vice-chairman, Rochester, N. Y.; Dr. W. H. Renwick, secretary, Sacramento, Cal. *Section III.—Chemistry and Metallurgy.*—Dr. M. L. Ward, chairman, Ann Arbor, Mich.; Dr. Henry H. Boom, vice-chairman, Philadelphia; Dr. H. A. Tuckey, secretary, San Francisco. *Section IV.—Oral Hygiene and Prophylaxis.*—Dr. Herbert L. Wheeler, chairman, 560 Fifth avenue, New York City, N. Y.; Dr. W. W. Belcher, vice-chairman, South Rochester, N. Y.; Dr. Robert W. Hall, secretary, Salt Lake City, Utah. *Section V.—Materia Medica and Therapeutics.*—Dr. J. P. Buckley, chairman, 39 South State street, Chicago, Ill.; Dr. Carl D. Lucas, vice-chairman, Indianapolis, Ind.; Dr. Frank C. Pearn, secretary, Portland, Ore. *Section VI.—Oral*

Surgey.—Dr. Truman W. Brophy, chairman, 81 East Madison street, Chicago, Ill.; Dr. Adolph Bernhart Baer, vice-chairman, San Francisco, Cal.; Dr. E. S. Barnes, secretary, Seattle, Wash. *Section VII.—Orthodontia.*—Dr. J. Lowe Young, chairman, 576 Fifth avenue, New York City, N. Y.; Dr. Robert Dunn, vice-chairman, San Francisco, Cal.; Dr. James David McCoy, secretary, Los Angeles, Cal. *Section VIII.—Operative Dentistry.*—Dr. John Sayre Marshall, chairman, 2912 Pine avenue, Berkeley, Cal.; Dr. H. E. Friesell, vice-chairman, Pittsburgh, Pa.; Dr. E. A. Tripp, secretary, Salt Lake City, Utah. *Section IX.—Prosthesis.*—Dr. Ellison Hillyer, chairman, 1143 Dean street, Brooklyn, N. Y.; Dr. F. W. Hergert, vice-chairman, Seattle, Wash.; Dr. C. O. Edwards, secretary, Oakland, Cal.; *Section X.—Education, Nomenclature, Literature, History, Legislation.*—Dr. C. N. Johnson, chairman, 22 East Washington street, Chicago, Ill.; Dr. Homer C. Brown, vice-chairman, Columbus, Ohio; Dr. Henry C. Fixott, secretary, Portland, Ore.

RULES GOVERNING OFFICERS OF SECTIONS, AND STATE AND NATIONAL EXECUTIVE

COMMITTEES.

Rules governing the Officers of Sections and Chairmen and Members of State and National Executive Committees of the Panama-Pacific Dental Congress, to be held in San Francisco, California, August 30 to September 9, 1915. *Rule I.*—The officers of each section shall constitute the Board of Censors for that section. *Rule II.*—The officers of each section shall co-operate with State and National executive committees in securing papers and clinics for the program of the congress, and also with the program and clinic committees. *Rule III.*—The officers of each section and the chairmen and members of State and National executive committees are empowered to solicit and receive from legal and reputable practitioners of dentistry and medicine, and persons proficient in the allied sciences, papers and clinics on subjects of interest to the congress, it being understood that each essayist or clinician is an authority on, or particularly well qualified to deal with, the subject presented. *Rule IV.*—The chairman of each section is invited to deliver an address before his section, not to exceed twenty minutes in length; this address to constitute one of the papers of that section. *Rule V.*—The aggregate number of papers accepted shall not exceed ten for each section, and not more than two-fifths of those accepted may be read by title. *Rule VI.*—Papers may be read and discussed before the congress in any language, but copies of all papers, or summaries, of papers, and discussions, typewritten in the English language, ready for printing, must reach the program committee in San Francisco not later than May 1, 1915. *Rule VII.*—Each paper and discussion will be printed in full in the published transactions of the congress, but a maximum of twenty minutes only will be allowed for the reading of a paper, or a summary of it, embracing its leading points, in case the reading of the original would occupy more than the allotted time, and five minutes for each speaker taking part in the discussion; not more than fifteen minutes will be allowed for the discussion of any paper, and the author will be allowed five minutes in closing the discussion. The author of each paper is requested to furnish the secretary of the section to which his paper belongs with the names and addresses of those who will discuss his paper. *Rule VIII.*—No clinic will be given a place on the program of the congress unless a concise description of it, typewritten in the English language, ready for printing, reaches the clinic committee in San Francisco on or before May 1, 1915. *Rule IX.*—State and National executive committees are governed by the rules governing the officers of sections, so far as they apply. Note particularly Rules II, III, V, VI, VII and VIII; also *Rule X.*—Each contribution to the program, either paper or clinic, shall be sent promptly to the chairman of the section in which its title indicates it to belong. In case of doubt, it shall be sent to the office of the committee of organization in San Francisco, this committee determining its place on the

program. *Rule XI.*—In the event of any controversy arising between contributors and the officers of any section the question at issue shall, at the discretion of the officers of the section, be submitted to the committee of organization for final adjustment.

QUALIFICATIONS FOR MEMBERSHIP.

State and National executive committees are empowered to receive applications for membership from none but legal and reputable practitioners of dentistry, who are personally known to be such, vouched for by an officer of the principal dental society of their locality, or by some other known reputable and legal practitioner. Each application must be signed by member of a State or National executive committee. Membership fee is ten dollars. Visitors to the congress not eligible for membership. Members may introduce members of their families as visitors to the congress upon payment of a fee of \$2.50.

PROGRAM COMMITTEE.

Dr. E. E. Evans, chairman, Union Savings Bank Building, Oakland, Cal.; Dr. Herbert J. Samuels, Oakland, Cal.; Dr. Shirley J. Ashby, San Francisco; Dr. M. J. Congdon, Berkeley, Cal.; Dr. C. T. Hansen, San Francisco.

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 OBITUARY.

DR. WILLIAM MITCHELL,

Late of 39 Upper Brook St., Grosvenor Sq., London, passed peacefully away after a long illness on June 9th, aged 60. The last rites took place at Golden Green on June 11th.

The above notice comes to hand just as we go to press. Dr. Mitchell's many friends in America—his native place—will be saddened by this intelligence. He was a lovable, whole-hearted man who instinctively drew to himself the affection of his fellowman, and whose influence in the profession was always of an elevating character. He made a signal success of his practice abroad, and retired a few years ago at the zenith of his career. We extend our sympathy to his family.

 DR. FERDINAND J. S. GORGAS.

DIED, April 8, 1914, in Baltimore, Md., in his eightieth year, Ferdinand J. S. Gorgas, A. B., A. M., D. D. S., M. D.

Those who have read dental literature at all extensively are familiar with the name of this distinguished author, and teacher. His books have had a wide circulation in the profession, notably his work on "Dental Medi-

cine" which has gone into eight editions. He was always most painstaking in his writing and teaching and his life and works have made a deep impression on the development of dentistry.

DR. V. E. TURNER.

DIED, May 11, 1914, at Raleigh, N. C., in his seventy-eighth year, V. E. Turner, D. D. S.

In the passing of Dr. Turner the South loses one of its brightest stars in the galaxy of the dental profession. Courtly, modest, dignified, and always a gentleman, he typified the best there is in professional and community life in the sphere in which he moved. He leaves a gap in the profession of America—a gap filled by the memory of a charming personality and the essence of a life well and loyally lived.

DR. ALTON HOWARD THOMPSON.

In the death of Dr. Thompson the profession loses one of its most distinguished representatives, a man beloved by all who knew him, and one well worthy of the splendid tribute paid him by his fellow-practitioner and townsman, Dr. Chester B. Reed, who knew him probably better than any other man in the profession. We are indebted to Dr. Reed for the following notice:

DIED, at his home in Topeka, Kansas, on May 13th, 1914, of paralysis agitans, Dr. Alton H. Thompson, after an illness covering several years.

In 1875 he married Miss Fannie Geiger, who died in 1903. They had two children, Isabel, who died in 1897, and Wallace, who is now living in New York, engaged in literary work.

In 1906 Dr. Thompson married Miss Helen Moon, who survives him.

He was born in Logansport, Ind., on April 18th, 1849. His father was of Scotch-Irish descent and his mother of English ancestry.

In 1859, the family moved to Dalton, Georgia, where they lived a number of years, and here it was that young Thompson first became interested in dentistry as a vocation, through the influence of Dr. M. H. Banner.

In 1866, he went to Mifflintown, Pa., and took up the study of dentistry with Dr. G. L. Dorr, afterward practicing in Millertown, of the same State. Dr. Thompson came to Topeka in 1869, and became associated with Dr. A. M. Calaham, one of the leading and progressive men of the State, with whom he remained about two years. Being of a studious mind, he decided to give up practice and take a course of lectures at the Philadelphia Dental College, from which he graduated in 1872. He then returned to Topeka, where he has lived continuously, with the exception of the winter of 1899-1900, when he returned to lecture at his old college, teaching comparative anatomy.

"The best of all eulogies is a well-spent life; its influence is the richest legacy a man can leave the world, because it is a constant source of light and inspiration to all those who follow him."

When Dr. Thompson passed into the great beyond, the dental world lost one of its most stimulating and uplifting influences; his whole life was one of unselfish service and devotion to the end of bettering his profession, all of which was contributed willingly and without thought of any compensation, other than that represented in the performance of those little acts which he construed to be duty, feeling that the full measure of remuneration was an approving conscience, and this to him was adequate—complete recompense.

Those who were privileged to have him for neighbor and fellow-townsmen will hold his memory as a most sacred benediction, not only on account of his learning and culture, but because of the human fellowship he radiated, and the unselfish interest he continually manifested in the welfare of others. He not only advocated but lived the doctrine of open-handed, open-hearted,

altruistic brotherhood, and he exemplified the principle *always* that "in proportion as we give, shall it be given to us." His life was in harmony with the fundamental law, "that according as we hew to the line of correct living and ethical conduct, the more useful will we be to ourselves and to others, our reward very likely being in pretty close ratio to the service we have rendered."

His name is indelibly engraved in the hearts and minds of all those who knew him best, because their lives were exalted and made sweeter by reason



DR. ALTON H. THOMPSON.

of his lofty influence and example, and if he is to be judged here and hereafter by what he accomplished, comforting indeed must be his reward. Although ill and a sufferer for a long time, he bore his afflictions with fortitude and resignation, and passed away sustained by that sublime confidence which is enjoyed only by those who rely upon a life characterized by purity, integrity and as one who had been a consistent disciple and follower of the Lowly One of Nazareth.

CHESTER B. REED.

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No. 8

ALUMINUM AS A BASE FOR ARTIFICIAL DENTURES.*

BY HART J. GOSLEE, B. S., D. D. S., CHICAGO, ILLINOIS.

As a base for artificial dentures aluminum possesses many advantages, chief among which are the properties of lightness of weight, conductivity, compatibility with the tissues of the mouth and cheapness.

For many years it has been used for this purpose, mostly in rolled-plate of about 26 gauge, swaged between metal dies. The possible advantages of casting it, however, were early recognized, and the work of Carroll, Zeller, Brophy, Harper, and others, while extending over a period of many years, and doubtless constituting the very first efforts toward the casting of metals as applied to dental purposes, was primitive and uncertain, and not until the advent of the methods of Dr. Taggart along other directions was it possible to achieve more than an indifferent degree of success in this process.

The relative advantages and merits of "swaged" and "cast" bases has been a debatable question for some time, and even at the present many are undecided as to which is the better method, or which affords the best results.

Swaged Bases. While it has always been conceded that a good, well adapted base is to be obtained by swaging, yet it is a somewhat singular phenomena that swaged bases are almost always attacked by the acids and secretions of the mouth, and that in many mouths almost complete disintegration of the base often follows in the course of a year or two.

This chemical phenomena has not as yet been observed in cast bases which have been worn for various periods of time up to

*Read before the Chicago Dental Society, May, 1914.

ten years, but whether this may be due to the fact that a better or finer grade of aluminum is to be obtained in ingot form than in rolled plate, or whether the swaged plate becomes contaminated by contact with the baser metals used for dies in swaging, is uncertain, but that this condition invariably presents will doubtless be attested by all who have made, used or observed swaged bases to any extent, or for any length of time.

Furthermore, it is practically impossible to provide sufficient mechanical means for insuring the secure and permanent attachment of either vulcanite or celluloid, or for preventing either from drawing away from the base along its edges. This warpage, of course, is due to the temperature at which it is kept when worn, but since the soldering of rims or lugs is precluded, and since it seems quite impossible to prevent it by etching, chasing, punching loops or any of the various mechanical means now used, a very insanitary structure necessarily results.

These two very objectionable features have caused me to practically abandon swaged bases, and several years' experience with both kinds has forced me to conclude that the advantages possessed and offered by the cast base make it, on the whole, much the better, and more reliable for at least three very important reasons:

First: Aluminum which has been cast is stronger, retains its shape better, and presents a greater density of surface.

Second: Opportunity for obtaining a mechanically better, more permanently secure and, therefore, more hygienic attachment of vulcanite or celluloid by means of undercut rims, spurs, lugs, etc., is easily provided in all cases.

Third: It is not affected to the same, if indeed to any, extent by the acids and secretions of the mouth.

Cast Bases. After reaching these conclusions, I resolved to develop a technic which would insure successful aluminum castings for dentures, with the same degree of accuracy and certainty that is now possible in casting inlays, crowns, etc., in which I received encouragement from the results achieved by Mr. Boch, of Chicago. After considerable experimentation I finally succeeded in accomplishing this end, but only to meet with a most deplorable disappointment in another direction.

Although a quite satisfactory adaptation is to be obtained in perhaps a majority of cases, yet, at the present time, and with our present methods and technic, perfected as they may or may not be, bases cast of pure aluminum do not seem to fit in all cases as well as do those which are swaged.

This unfortunate and discouraging condition may be attributed, and is doubtless due, to the shrinkage or warpage of the casting in cooling, or to the lack of integrity, or the inadequate resistance, offered by the investment material, of which the mold, and into which the casting, is made, or to both.

At best, aluminum is a most peculiar and refractory metal, and this warpage or shrinkage, which is, of course, due to the readjustment or rearrangement of the molecules during and after crystallization, is probably to be diminished or overcome only by alloying or by the use of a very high grade of investment material.

With any of the investment materials now used for this purpose, it does not seem to matter how rapidly or how slowly the case is cooled after the casting is made; whether it is plunged into cold water immediately after crystallizing, or allowed to stand until thoroughly cold, or even for a day or so afterward, it will be noted that as soon as the case is removed from the investment and the resistance offered thereby is released, the molecules will at once rearrange and readjust themselves, which is to be observed by holding the casting close to the ear and noting the musical sounds which are easily discernible.

Some experimental work in alloying pure aluminum with a small percentage of copper, and of silver, seems to indicate that the addition of from three to five per cent of copper reduces the shrinkage, and the tendency to warpage in crystallizing, but so far no alloy has been found which will entirely eliminate this objectionable feature.

To insure satisfactory results in cast aluminum bases, therefore, and to eliminate the possibilities of failure and of inaccuracy, it is necessary that we find either an alloy which will retain its form after casting, or an investment material which will preclude the possibility of change, or that we resort to swaging the base after it has been cast. In the absence of the desired alloy and investment material, this latter procedure will insure accuracy in

all cases, and would be simple if the original model, or cast, was preserved, and if it be made of a substance sufficiently hard to withstand swaging directly upon it, which might be done with any of the shot or modelling compound swaging devices, and which procedure seems to be the nearest approach to the solution of the problem of positive accuracy at the present time.

For this and other similar purposes where an exceedingly hard model is required, Dr. J. H. Prothero has suggested that Commercial Calcined Magnesium Oxid (Mg. O.) mixed with a saturated solution of magnesium chlorid (Mg. Cl₂), well spatulated and to as thick a consistency as may be used, and then allowed from 12 to 24 hours to harden will produce a model or cast, which is almost as hard as flint, and practically indestructible.

If the original model may be made of this oxy-chloride of magnesium compound, or of some similar substance, then a high degree of accuracy would be insured by swaging upon it after the casting has been made, which is possible if the "transfer" or "indirect" method, to be referred to later, is followed.

In the absence of an indestructible material good results may be obtained by making the model of very hard plaster, or of a high grade investment material, and following the procedure which has been designated as the transfer or indirect method, by which means failure, while not eliminated, is overcome, because of the preservation of the original model from which any number of wax bases may be made until a satisfactory casting has been obtained.

TECHNIC.

Indirect Method. In following the indirect method, when a good model has been obtained the entire marginal outlines of the base should first be well defined on it by scraping, after which it should then be prepared by giving it a good coating of sandarac varnish, followed, when dry, by rubbing soap-stone or talcum powder over it.

With the model thus prepared (Fig. 1), ordinary pink base-plate wax should now be very carefully molded and trimmed to the proper outlines, and rims and other mechanical means of attachment for the vulcanite then made until the wax assumes all of the features required in the finished casting (Fig. 2).

Rolls of soft wax about the size of an ordinary slate-pencil, which will form the sprue-holes for casting, should then be attached to the wax base. If the flask and machine with which the



Fig. 1.



Fig. 2.

casting is to be made require a horizontal position of the mold, the wax sprues, of which there should be three, should be placed at the posterior border of the base, one in the center and one at

each heel (Fig. 3), while if a vertical position of the mold is required the sprues should be placed in the center of the ridge labially and at each heel, and the other or free ends then made to converge until they meet in a common center (Fig. 4).



Fig. 3.



Fig. 4.

In the machines which I have used one is a centrifugal, requiring a horizontal position of the mold, while the other is a combination vacuum and pressure which requires a vertical position, but the results are about the same with either, in so far as the casting is concerned.

When the wax sprue formers are properly adjusted in accordance with the requirements of the machine to be used, the whole exposed surface of the wax base should now be covered over with a good, fine grade of "casting" investment material, first carefully painting it on with a brush, so as to eliminate air

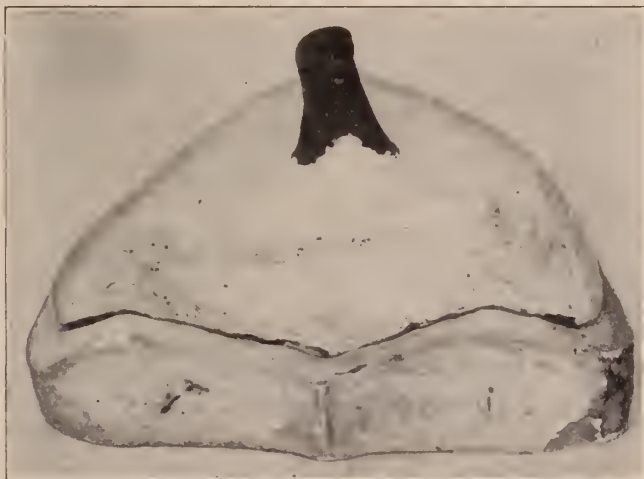


Fig. 5.



Fig. 6.

spaces and insure a smooth surface, and then building it up to a thickness which will insure strength. (Fig. 5.)

This admits of the removal of the wax base from the model without danger of distortion, and when the investment material has crystallized, and the base, thus protected on one surface, has been removed (Fig. 6), the palatal or maxillary surface should

then be filled in and protected in similar manner, the entire wax mold together with sprue formers being thus completely encased in a high grade of casting investment material, with the exception of about one-half of the length of the latter, which should remain exposed (Fig. 7).



Fig. 7.



Fig. 8A.

In cases where there is a considerable undercut, either labially or at the heels, such as would preclude removing the wax base, the model should be previously reconstructed and made with a separate section for each undercut. These sections may then

be placed together, and held in position with hard wax, until the wax base has been molded and protected with the first layer of investment material. The hard wax sustaining the relation of the sections may then be removed and these sections lifted away first, after which the main portion of the model may be easily removed (Fig. 8 A and B).

This should now be invested in the casting flask, using any good "soldering" investment material, and before which the mass of investment material surrounding the wax base and sprue formers should first be allowed to become thoroughly saturated with water in order to insure the absence of air spaces anywhere within the flask.



Fig. 8B.

When the case is thus properly flaked and the investment material thoroughly crystallized, it should be ascertained that ample space in the form of a crucible to hold sufficient metal for the casting is provided, after which it should be thoroughly dried out at a low temperature, and then the heat gradually increased until the wax is burned out and its residue and by-products are completely dissipated, which usually requires from three to six hours. The case should then be allowed to cool down until only moderately warm, before casting.

In melting the aluminum previous to casting, new clean ingots should always be used. The metal should never be over-

heated, and, when fusing should be slightly agitated with the end of an ordinary slate-pencil from time to time, and all dross removed, until a smooth, clean surface presents, after which the



Fig. 9A.

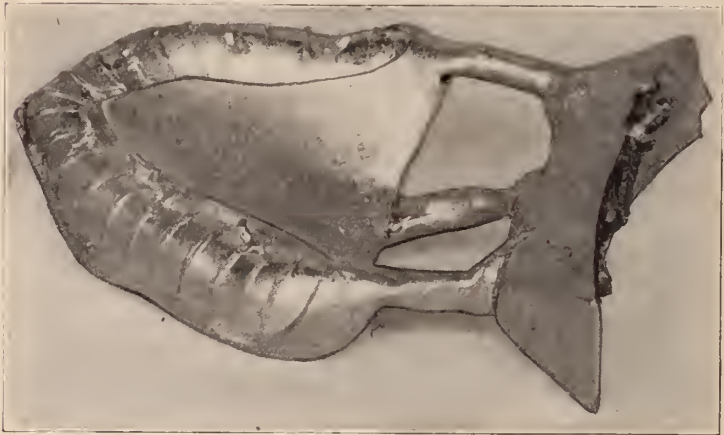


Fig. 9B.

casting should be made, observing only moderate speed in doing so, as the metal remains liquid for some moments.

Castings made with both styles of casting machines as previously described are illustrated in Fig. 9 A and B.

"Direct" Method.

The technic for that which has been designated as the "direct" method differs only in that the wax base is not removed from the original model, but is allowed to remain and is invested in the casting flask in position thereon. Since the casting is thus made directly upon the original model, and since no duplicate or reproduction is ever quite as accurate as the original, this would seem to be the better method. (Fig. 10.)



Fig. 10.

It undoubtedly would be the best method, providing we have developed our technic to a point which insures a perfect casting each time, and then providing that these castings be fitted so accurately that subsequent swaging would be unnecessary.

Until such time as we surmount these obstacles, however, the "transfer" or "indirect" method is unquestionably better, because it means but one impression, and but one model, from which any number of castings may be made, and upon which the casting itself may be finally swaged, if desirable, and if the model be sufficiently hard.

This procedure applies to partial cases as well as to full dentures, and to lower as well as upper bases.

When the base has been successfully cast, practically all of the finishing and undercutting of the rims should be done before the final fitting, after which it should be used as a "bite-plate" in taking the "bite." The finishing may be most easily accomplished with files, carborundum stones and vulcan-carborundum cones and wheels, and for the final polishing tin oxide will be found most useful, and to produce a beautiful luster.

For the attachment of the teeth to the base, pink vulcanite is probably the best substance for the purpose, though celluloid and similar compounds are used to some extent. The latter afford a more natural, gum-like appearance, and a lightness of weight, both of which are somewhat advantageous, but these advantages are overcome to an extent by the lack of strength, more temporary characters, and greater absorptive properties of such compounds.

When pink vulcanite is to be used, if that portion of the metal base to which it is to become attached is painted with the ordinary rubber cement, such as is used in making temporary patches in soft rubber goods, just previous to packing, a closer union and firmer adhesion of the vulcanite to the metal base will obtain. This claim is made by Dr. G. A. Thomas, of Chicago, who has done much along these lines.

The attachment of the teeth by casting directly to them is always to be condemned, even in partial cases, because the only possible advantage thus gained is the saving of the time required to vulcanize, and this is gained at the expense of the strength of the porcelain teeth, even though they may not be fractured, and is a procedure which is fraught with danger and uncertainty at all times, and under all conditions.

Lest the apparent simplicity of this technic be misleading, however, I want to suggest that while it is not overdrawn in the least, still no one should expect to obtain satisfactory results without first experimenting until a reasonable degree of self-confidence and certainty obtain. When these do obtain, then I believe we are able to give to our patients one of the very best types of artificial dentures.

DIAGNOSIS BY THE GENERAL PRACTITIONER AS A FACTOR IN PREVENTING DEFORMITIES OF THE JAWS AND FACE.*

BY DR. F. C. RODGERS, ST. LOUIS, MO.

Every dentist is interested in assisting nature to develop a perfect denture, and from an esthetic point of view, we should all be orthodontists in the literal sense of the word. There is nothing more important than a perfect set of teeth to add beauty to the face, to illuminate a smile or to promote a cheerful disposition.

In the examination of abnormal and incorrigible school children, you will find them with defective teeth, and children that are so handicapped in their early life, develop abnormal minds and weak bodies prone to evil habits.

It is within the province of the dentist to assist in the development of a better race of people, which will accomplish more for Eugenics in one generation than scientific mating will accomplish in ten generations. Our efforts for higher ideals will be appreciated only in proportion as we educate our patients to a proper understanding of these ideals, and our success will be according to their appreciation.

The responsibility of the dentist to his patient is greater during the mutation period of the teeth than at any other time of life and he should encourage frequent visits for the purpose of observing the progress of the erupting teeth, and any deviation from the normal development should be corrected at once; also any abnormal factors that are causing the perversion from the ideal.

The methods of treating orthodontia cases have changed very materially in the last decade, enlarging the field for the practical application of orthodontia to almost any type of irregularity. Owing to a better understanding of the dynamics of tooth movement and the application of force, together with the improvement in orthodontia appliances: the age of a patient, which was considered such an important factor in the past, is no longer a handi-

*Read before the St. Louis Dental Society, January, 1914.

cap, and the cases that were formerly considered hopeless, are now treated with success. As a result of this condition, the profession at large has hardly been able to keep up with the progress made in this specialty and there is prevalent a divergence of opinion regarding the diagnosis and treatment of irregularities of the teeth.

A discussion of the methods by which these results are obtained would be out of place before this society, just as much as a discussion of the technic of making a gold inlay would be before the Society of Orthodontists. What the general practitioner is more concerned with, are the underlying factors operating in producing deformities and the critical period when necessity for treatment is indicated; for the reason, that he is in a position to first recognize the tendency towards malposition of the teeth and jaws. This treatment depends upon advice to his patients.

At the outset, it must be clearly understood that the bony structure supporting the teeth is transitory in nature, and will only grow and develop during the presence of the teeth. The alveolar process is of the cancellous or spongy variety and is continually undergoing changes in density, forming new bone by deposits and absorption in response to stimulation, which is transmitted by means of the teeth and muscle attachment to the alveolar periosteum.

In adults, we find more periosteal and haversian system bone, while in children there is a greater amount of cancellous bone, in consequence of the nature of this bone formation, tooth movement is more easily accomplished in children than in adults. This important factor must be taken into consideration in diagnosing a case for treatment. It requires greater stress to move a tooth through the process at eight years of age than it would at seven. We are justified then in making a concise statement that the "treatment should be started at the beginning of an irregularity and not wait until it has developed."

I wish to emphasize another important point in connection with diagnosis. Parents will sometimes notice a developing malocclusion in the child's mouth and consult the dentist about it, he will often minimize their fear with the statement, that nature will correct the deformity, or with the advice to wait until all the teeth have erupted.

These statements are often made without due consideration of the injurious effects resulting from delaying the case. Nature never corrects a defined case of malocclusion, and time only makes treatment more difficult. The patient cannot help but find this out and at the same time discovers the diagnosis of the dentist was not correct. This invariably results in a loss of confidence in the dentist and is a distinct detriment to his professional prestige.

If we have a clear understanding of the basic principles of malocclusion, we know that it is progressive: the longer a case is delayed the more it assumes a serious aspect; so it is consistent with good judgment to advise early correction as a means of preventive treatment.

REMINISCENCES OF SEVENTY YEARS' PRACTICE.

BY DR. LOOMIS P. HASKELL, CHICAGO.

I was born in Bangor, Me., April 25, 1826. My father died when I was five years of age. I have a letter written three days after I was born by a sister to a friend, in which she rejoiced at the advent of a brother, but was fearful he might not live as his two eldest sisters died of quick consumption. However, he seems to have survived, and is at present writing in perfect health.

Upon the death of my father, my mother was compelled to take up nursing for a living, and for several years after I was six years old I was boarded on a farm, where I attended school in the little "Red Schoolhouse."

When I was eleven years old my mother married and we removed to Salem, Mass., where I attended school, one year in the High School, then went to Boston in 1841 and entered a printing office as an apprentice to have remained until twenty-one. Four years later a brother-in-law wished me to take up the practice of dentistry, which I did. The experience in the printing office, especially in type-setting, proved a valuable experience and had much to do with my later work in writing for dental journals and newspapers.

There was but one dental college and that was in its infancy, and it was the opinion of dentists in those days that the young man

would be better prepared for practice by spending several years in the office of a good dentist than in the college of those days.

There was one dental journal published in New York, but I seldom saw it. Dental offices were close corporations, as no dentist was allowed, unless very intimate, to witness another dentist at work at the chair or in the laboratory. There were no dental societies, national, state or local.

The graduate of the colleges of today can see what great advantages he has in every direction. Were he placed in the dental office of sixty years ago, with the materials, appliances and methods then in use he would be utterly at a loss to know where to begin or how to do.

In the laboratory there were but few tools and they were poor as compared with those of today's. A foot-lathe, very crude and for grinding emery wheels made with shellac; so they had to be kept wet or the heat of grinding would distort them.

The dentist would have to make his gold plate, which involved the use of a furnace, mould, etc., and a pair of rolls. Gold coin was used but the karat was reduced to 18 usually. He had to make his solder and that was usually 18 to 16. However there were many dentists resorted to the manufacturing jewelers for their supplies.

Teeth were kept at drug stores, but in limited quantities. Many single-gum teeth were used for full sets, upper and lower. The teeth in use were Alcock's and Stockton's, the latter being the instructor of S. S. White.

In 1848 Jones, White & McCurday of Philadelphia, opened the first dental supply house in Boston. But they did not furnish gold plate, wire or solder. Dr. Goodno, my partner, an expert gold worker, for a time filled their orders. Then White's teeth were placed on the market.

Here begins the work of the subject of this article. Some dentists were making their teeth in carved sections. My preceptor sent to Philadelphia for an expert in this work, but after a while it occurred to him that the expert might leave him in the lurch some day, so he decided to have me brought into the business, and learn

tooth making; and for eleven years I was doing this, also mounting the work.

This work involved the preparation of all material. Taking the crude sillex and feldspar, in large pieces, heating them red hot in a furnace, then plunging in cold water so as to be easily broken into small pieces; then ground in a large quartz mortar to a fine powder. These materials, with some kaolin were mixed in proper proportions. Coloring materials for the body and enamels were prepared including that for gum color which was the oxide of gold and tin.

The gold plate having been fitted and wax rim showing length and fullness for the gum sections, a carving model was made, making allowance for shrinkage, and the porcelain material, which could be handled like putty, was moulded to the model for the anterior teeth, partially dried, and teeth carved. Separation of the teeth was made with short pieces of whalebone, to which a thread was tied, forming a bow. The material was then dried and removed, and posterior blocks carved. These were placed in the muffle and "biscuited," so they could be trimmed, edges of gums matched, holes drilled for the platinum pins, these inserted, and the teeth and gums enameled and baked. The earliest furnace was constructed of brick, five feet long, two feet wide, lined with fire brick, soap-stone covers; muffles 14 inches by 4 in.; bars to pull out to let down the fire when done. The fuel was the best of the Lehigh coal. The fusing point was higher than that of the teeth of to-day. These teeth then had to be ground to snugly fit the plate; the plate then banded to the gums, invested, backed and soldered.

This work was done not only for our practice but for other dentists, who were charged \$12.00 for the sections. Fifty dollars was the average fee charged patients.

(To be continued.)

WHAT A LECTURE ON ORAL HYGIENE SHOULD COVER
THAT IS DELIVERED BEFORE VARIOUS
KINDS OF AUDIENCES.*

BY W. A. WHITE, M. D., PHELPS, NEW YORK.

Consultant and Lecturer on Oral Hygiene for the State Department
of Health.

Mr. Chairman and Gentlemen: It is not my purpose to undertake to instruct you along the lines of oral hygiene. To my mind there is no subject before the dental profession today that is of so much importance or is receiving so much attention. It is hardly necessary for me to call your attention to the remarks of Dr. Mayo when he said at a banquet which was given to your distinguished citizen, Dr. Brophy, that "Preventive medicine lies in the hands of the dental profession." Those were his closing words. You understand, he meant by that it was the duty of every man practicing dentistry to instruct his patients what oral hygiene is, and he meant by that, a clean mouth prevents disease.

Before introducing the slides showing the method which we are pursuing in the state of New York in instructing the boys and girls in our schools, I want to leave the words of some eminent men in the medical profession of the United States with you. One I have just referred to—Dr. Mayo. The other is Dr. Neff, of New York, who is recognized as an authority in this country on the treatment of tuberculosis.

At the Fourth International Medical Congress, held in Washington, standing before an audience composed of medical representatives of thirty-six foreign countries, the personal medical attendants of every crowned head and of every state represented in this audience, he prefaced his paper with these remarks: "I defy the most skilled physician either to help or cure a tubercular patient that has decayed teeth in his mouth." You can study that remark of Dr. Neff's, as I think it affords much food for thought and reflection.

*Read before the 50th anniversary of the Illinois State Dental Society, March, 1914.

Dr. Jacobi, who is known throughout the United States as the "Grand Old Man of Medicine," at the Mouth Hygiene Congress at Buffalo last August used these words: "If more attention was paid to the care of the mouth and teeth, there would be far less sickness among both old and young."

Dr. Roswell Park, who died suddenly only a few weeks ago, who was known throughout New York State as one of the most skillful surgeons in the state, who was to be the leading member of the program in the forthcoming meeting of the State Dental Association, was going to read a paper on "Septic Systemic Conditions Directly Traceable to Diseased Conditions of the Mouth and Teeth." I am simply giving you an expression of opinion on the part of eminent medical men on the subject of oral hygiene, all of which shows the importance of this subject.

In going about the State, in lecturing on the subject of oral hygiene, the impression prevails in many places that I am simply traveling around working up patronage for my fellow practitioners, but I use every effort to disabuse the minds of the audience of that fact if they entertain any such idea. I am trying to teach the boys and girls how to prevent disease and impress upon their minds what the lectures are, bringing to their attention the important point that in the future there will be less work for the dentists to do than there is to-day.

In regard to the work done in your state and the number of dispensaries which you have, I wish to take back a statement I have made. I had supposed that Rochester had the greatest number of dental dispensaries of any city in the United States, but I want to take off my hat to Chicago. She has a greater number.

In regard to the work done last year, I visited seventy-four cities and towns in my state; I have given one hundred and five lectures, have spoken to 100,000 boys and girls, and the object in coming before you this morning is simply to give you an outline of the methods we pursue there, and show the need of the instruction we are giving the boys and girls through the medium of stereopticon slides, which I am going to show you later this morning.

It has been quite a surprise to me in the places where I have made return visits to find how much attention and heed is given by the boys and girls regarding the care of the mouth and teeth.

In the city of Poughkeepsie I went to have a review of the lessons and in going from school to school I found the Superintendent of Schools is one of the most enthusiastic workers along this line. I found the same sentiment existing among those in charge of educational institutions throughout the state. In the city of Poughkeepsie I learned that there were thirty-eight per cent. of the boys and girls who had never given the mouth any care or attention; that they had never been to the office of any dentist to have their mouths put into a clean healthy condition. I have also learned from reliable statistics and found the same percentage existing there as quoted by your Chairman, Dr. Molt, about 95 per cent. needing dental attention. Throughout our entire state the same ratio or percentage exists, where boys and girls have failed in their studies; 45 per cent. of the failures have been due to absence from school caused by abnormal conditions of the mouth and teeth. This ratio existed throughout our entire state.

The course we pursue is to try to teach the officials of our municipalities or show them how much cheaper it is for the taxpayers to maintain a free dental clinic than to carry on repeaters. What I mean by repeaters is this: let us take the city of Poughkeepsie, I find it is costing the city of Poughkeepsie or its taxpayers this year \$16,000 and some odd dollars to care for their repeaters who have failed in school on account of some physical defect, and 45 per cent. of these defects are due to abnormal conditions of the mouth and teeth. It is far cheaper for them to maintain a free dental dispensary.

In the city of Albany it costs \$45,000 a year, and in the city of Olean, it cost \$116,000 a year to carry over their repeaters.

If you are not all residents of Chicago, go to the superintendent of schools and find out what it cost the citizens to maintain the schools during 1912 and 1913; find out how many scholars there are, and the cost per capita; how many failed in their studies and had to go over the same ground this year as last, and also find out the causes of absence from school. I think you will find the ratio to be 45, and if you tell the Board of Education what it is costing the taxpayers to care for repeaters, and that it is much cheaper to maintain a free dental clinic, when you touch their pocket-books you touch their hearts.

In regard to New York City, two years ago through my personal efforts with the Health Commissioner the matter was taken up as an experiment. It was generously received by the medical profession and by the dental profession, but more so by those in charge of educational institutions. It required very little time to impress upon the Commissioner the importance of the subject. The matter is now under Civil Service Rule, and those who wish to pursue this work have to take the Civil Service Examination. I took that examination in June and was successful in passing it, together with others, so that the oral hygiene lectures are given by regular members of the State Board of Health, and they recognize one official of the Health Department of the City. It has grown, and I think it has reached the same point in the State of Illinois and other states, and you will be surprised as to the number of letters of inquiry I receive which come from all over the United States, and in several instances we find the same sets of slides where the work is going on in the same way. In regard to the slides, I do not expect to teach the members of this association but simply to refresh your minds with some of these pictures and to show you how we are teaching the boys and girls with regard to the subject of oral hygiene and the importance of caring for their health.

The demand for these lectures is so great that it is impossible to supply the demand for them. (Dr. White then showed numerous slides that are used in imparting instruction on oral hygiene to boys and girls in the schools.)

PROCEEDINGS OF SOCIETIES.

CHICAGO DENTAL SOCIETY.

A regular meeting of the Chicago Dental Society was held on Tuesday evening, May 19, 1914, at 8 P. M. in the University Building, 31 West Lake Street, Chicago.

Dr. George N. West, President of the Society, occupied the Chair.

Dr. Hart J. Goslee presented a paper on the subject of "Aluminum as a Base for Artificial Dentures."

DISCUSSION.

DR. J. H. PROTHERO:

Mr. President and Members of the Chicago Dental Society. I regret not being present at this meeting to enter fully into the discussion of the very excellent paper presented by Dr. Goslee. The methods he recommends and has so carefully detailed will yield excellent results if carried out as suggested.

I wish particularly to emphasize the benefit in better adaptation to be derived from the fitting of a cast base on a hard model or good plaster cast of the mouth. This may be done as Dr. Goslee suggests in a shot swager or equally good results with less danger of fracturing the model can be secured with the Ash Cushion Swager. In this device screw pressure is applied instead of hammer blows as in the shot swager.

In using the magnesium oxychlorid for models, care should be taken to form the bases perfectly flat, as otherwise if not supported at all points, fracture of the model is liable to occur in swaging. This material will withstand great stress under direct pressure but fractures readily under vibratory stress if not well supported.

In my own experience swaged aluminum base dentures have proven more serviceable than cast bases of this material. The gauge used, however, is much heavier than that mentioned by the essayist, which may account for the satisfactory service bases of this type have shown.

For a number of years past, I have used and recommended nothing lighter than 18 gauge. Plate of this gauge is $2\frac{1}{2}$ times thicker than 26 gauge and therefore affords better opportunity for

securing anchorage for the vulcanite. It is much more rigid than the lighter gauge and yet it can be adapted to the die with comparative ease. When grooved deeply along the line where the lingual margin of the vulcanite terminates, and that edge of the groove nearest the border crest is cut away, a well defined shoulder is formed against which to finish the vulcanite so that there is little or no tendency for the margins of the latter to curl up or break. The spurs can be made long and heavy and when opposed to each other as they will be when the graver is applied from opposite directions, ample anchorage is afforded the vulcanite.

In the many cast bases which have been broken for testing purposes, every one showed spaces of greater or less size when viewed in sectional area extending from lingual to palatal surfaces. This fact accounts for the rapid disintegration so often noticeable in cast aluminum bases since the fluids of the mouth carrying solvents of the metal gradually penetrate the body of the base plate.

The precise methods of technique in casting suggested by the essayist may insure a denser product and thus overcome the tendency to rapid disintegration mentioned.

This essay deserves careful consideration for the many good ideas detailed and the essayist commendation for his valuable work in this field.

DR. G. W. DITTMAR:

Mr. President and Members of the Chicago Dental Society, Doctor Goslee's apology for not getting a copy of his paper to me previous to the meeting is accepted. I regret, however, not having an opportunity to read and study the paper so that I might have something of interest to say. I really feel that it is a waste of time for me to try to discuss it. I must however compliment the essayist on his most excellent presentation of the subject. The paper is a classic and this elaborate and beautiful exhibit speaks for itself. Dr. Goslee, indeed, merits our thanks for this most interesting and instructive contribution.

Previous to the advent of the casting process as given to us by Dr. Taggart, the casting of pure aluminum into castings as beautiful and perfect as these shown tonight would have been impossible. Aluminum alloys were used and though some authorities claim numerous advantages in pure aluminum, I notice the essayist

seems to favor certain alloys in preference to the pure metal.

In making the casting, I have used the centrifugal force method almost exclusively; it is so simple and so certain. For the casting of metal bases I prefer it to the gas pressure methods. In placing the sprue I like to place the main sprue so that the metal will be forced to the farthest or deepest portion first—and at the shallowest or nearest the surface parts I like to have a couple of small vents about the size of a 16 gauge wire. This facilitates the escape of the confined air and thus insures a more perfect casting.

The thing that surprised me most, here tonight, was to see the decided change in the fit of the casting as compared with the wax model from which we have learned a most valuable point; viz., the swaging of the casting to refit it to the model. At our big meeting in March, Dr. Willis Costin of Topeka demonstrated a similar proposition with reference to fitting complex cast gold inlays, i. e., swaging them into amalgam dies, or rather into amalgam replicas of the cavities.

We have all noticed changes in large castings, enough warpage to cause considerable trouble. Dr. Goslee has shown us how to correct this in cast denture construction and thus secure a perfect fit. I am sorry that Dr. Prothero was not here to open this discussion. I, however, see Dr. R. C. Brophy, who is to follow me, and who, because of his large experience in this line of work, will, I am sure, give us a valuable discussion.

I thank you.

DR. R. C. BROPHY:

Mr. President, it is rather a rare thing nowadays for dental gatherings to take up and discuss platemaking. Making plates is an old matter of practice, and it is an old time-worn theme for discussion, but it is a department of practice that still endures, and so long as it does endure I think it proper that it should be kept in mind and generally discussed. Personally I feel that it is not a subject too old or too commonplace to be considered by any dental society, and therefore I regard it as inappropriate for apologies to be offered by dentists in presenting it.

I am particularly pleased that the essayist has presented the special subject of aluminum cast bases, for it is one which in times past was of great interest to me. It is interesting to me now only

as I look back and reflect upon the experience which I had as an active advocate and promoter of the use of the base in the face of the decidedly adverse attitude of the general profession which prevailed at that time. It is pleasing to me to know that the stand which I took at that time has come to be endorsed by the profession now, and that the cast aluminum base has attained, as it deserves, a high popularity.

In looking over the paper I was struck first of all by an unfortunate omission made by the essayist. In naming the pioneers in the work of casting aluminum plates, Carroll, Zeller and others are mentioned, but the real pioneer, the father of the idea and the earliest experimenter in the work, Dr. Bean, is not mentioned. I feel that this omission is unfair to the memory of Dr. Bean. I might say further, that inasmuch as the essayist touched upon the process of swaging bases to the model after casting, it would have been proper to have mentioned the name of Dr. W. B. Streetman, of Clerburne, Texas, who originated this process, and for many years advocated and demonstrated it throughout the country.

The relative advantage of swaged and cast aluminum bases is not now as generally questioned as formerly. Sentiment is rapidly growing in favor of the cast base for the very good reason that the profession and the laity are rapidly learning from experience that they are more satisfactory.

The essayist has raised the question as to why swaged aluminum base-plates are more susceptible to disintegration in the mouth than cast base-plates. There is a very logical reason for this. The purest and least contaminated aluminum to be had is not attacked by oral secretions. Chemical action can only attach through impurities embodied in the metal. Aluminum in ingot form, it is reasonable to suppose is uncontaminated, or the least contaminated. Aluminum rolled plate may, and undoubtedly does become contaminated. It is rolled in iron; it is swaged between base metal dies while saturated with oil, and impurities are practically driven into the metal's surface, there to be attacked and eaten out.

The rare instances of disintegration of cast aluminum bases are accounted for as readily. Carelessness may be exercised in making the cast whereby the dross film which always forms on the surface of the metal when it is fused, may be forced into the mould.

It is a matter of importance sometimes overlooked that a single, solid ingot of new metal should be used. Good results do not follow the use of separated ingots or pieces of metal or scraps because of the increased quantity of dross, and the consequent increased danger of forcing particles of it into the mould. Uncleanliness may be indulged in whereby dirt or foreign substances may become incorporated with the metal when molten. It may lie in the crucible, it might be carried into the metal through the erroneous stirring of the molten mass.

The metal may be damaged by overheating so as to seriously impair the integrity and lasting qualities of the plate. There is too much indifference as to the quality of the wax used. Some waxes are adulterated and carry indissoluble substances as a filler. These waxes should be avoided. The metal when injected into the mold should be condensed. A cast may lack condensation, and this always impairs its lasting qualities.

The essayist has pointed out the advantage the cast base presents in the more secure mechanical retention of the attachment possible, and also, has raised the question of adhesion of vulcanite to aluminum, suggesting, as his opinion, that vulcanite and celluloid are caused to warp away from the metal by the temperature in which the plate is held while being worn. It will be of interest in this connection to know the result of experiments made by Dr. John Bohr of this city, who undoubtedly has had a wider experience in the casting of aluminum plates than other dentists of the time, to determine the effects of varying conditions upon the adhesiveness of vulcanite to aluminum. A case kept in a glass case out of doors for six months, a case kept in a jar of water in ordinary house temperature for six months, a case kept in a butcher's ice box for six months, and a case worn in the mouth six months, all having been packed under similar conditions, all showed a similar extent of warpage and separation. This of course, would tend to explode the theory that oral secretions or body heat or both of them combined, are responsible for this failure of adhesion.

I believe that the best means to promote stable union between aluminum and attachments is extremely thorough scraping of the surface of the metal, the painting of this surface with a solution of vulcanite or vulcanite cement as suggested by Dr. G. A. Thomas,

and the careful packing upon this surface of a layer of weighted rubber, this to be followed by the ordinary packing of the case. I have demonstrated to my own satisfaction that this procedure is effective in preventing this separation, the most objectionable feature pertaining to metal base plates. Without this treatment, perfect adhesion cannot be expected regardless of the perfection of undercuts made and the care with which the stippling is done.

The essayist suggests that the imperfect fitting of cast aluminum bases sometimes met with is due to shrinkage, but he does not claim to be clear as to where the trouble really lies, nor to know just how to overcome it. He charges the metal with shrinking, which is a well-founded charge; he suggests that model material which is sometimes used is not reliable as to maintaining a true form, which is emphatically true. Having to acknowledge therefore, the existence of these two unfavorable features, I would suggest as imperative to the successful accomplishment of the work that we get after the man who does it, and show him how the above-mentioned conditions may be overcome.

Aluminum undergoes contraction when passing from the hot molten state to the cold solid state, but the contraction in a great majority of cases aids rather than interferes with the fitting of the plate. In all cases where the arch approaches the normal no trouble is experienced from contraction of the metal, and it is only in those cases where the arch is excessively high—cases which are rare—that the normal shrinkage of the metal interferes with the palatal contact of the base. In the experience of many men but few cases are met with wherein perfect palatal contact cannot be secured by expert relieving of the model.

No power which the dentist has can modify the molecular change in a metal, except of course it be done through combining it with some other metal, and for that reason it is impracticable to try to prevent the shrinkage of aluminum in cooling plates unless it be done by alloying the metal prior to using it. Allowance must be made for its shrinkage through manipulation of the impression or the model. The hardness or the general character of the model, if not properly prepared, cut but little figure in the fitting of the base.

My discussion of this paper, ladies and gentlemen, is unsatisfactory to me as I fear it will be to you, because I have been com-

pelled to go over it in a hop, skip and jump manner. The theme is one deserving of more consideration and more lengthy discussion than I am able to give it. It will perhaps be noticed that I have not touched upon that part of the paper which describes the essayist's technique in casting aluminum bases. I feel that I could not go into this with the slightest hope of covering it as I believe it ought to be covered, at this time. I might say, however, that I regret that I cannot enter into a discussion of some of the features of the process termed by the essayist the "indirect method." I must frankly say that I am not ready to approve of some of the principles which are applied. I heartily agree that it would be a most excellent thing if we were able to preserve the original model for repeated use if called for, but farther than this, I must admit that I see little in the process which appeals to me as marking an innovation of value in practice.

I shall await with much interest the decision upon the question which later will be handed down by the general profession.

DR. LUCIEN H. ARNOLD:

The faultless paper so cleverly exposing the findings of our esteemed Dr. Goslee and the beautiful specimens of casting which accompany the paper are spurs and incentives to all who do laboratory work to improve it, and none can fail to profit by both who will take the trouble to follow the clear and clean cut phrases of this gifted author.

In his paper he rather intimates that the place at which the sprues are attached is merely a matter of convenience but it has seemed to me that this matter has had much to do with producing perfect or imperfect castings.

Dr. Dittmar, with his usual suavity, mentioned that he had been in the habit of attaching the sprues one to each heel of the plate and a third one to the lingual ridge at about the middle. This has been tried out repeatedly both by myself and others in my laboratory and has shown a much larger percentage of failure than has been noted by the use of other methods.

It might be said in passing that all my experimenting and practical casting has been done with a so-called "Suction machine" and using most of the time the flask sold by the R. & R. people and about which Dr. Brophy with his very extensive experience with

these appliances could have undoubtedly given us much more information than I.

In using this form of flask the spruing is probably best done on the posterior border of the plate and the sprues may be either in the form of round sticks or flat sheet wax, either closely set or relatively far apart. My preference has been lately for the thin sprues and have used four rather wide sprues which will nearly cover the entire posterior edge of the wax model.

The essayist with logical discrimination gave particular preference to what he has termed the "Indirect method" of working and gave as his reason therefor that there is much danger of failure in casting and that it is much wiser to guard against having to take new impressions and make new models than to use the less laborious method of "Direct" casting and his preference has been amply justified by my own experiences.

Numerous failures led me to do as the essayist suggests, making the wax model for the plate from the model, then investing the wax alone rather than both the wax and model upon which it was made, thus preserving the model of the mouth for future use should the casting prove defective.

The oxychlorid of Magnesium mentioned in the paper is certainly one of the best if not *the* best model material ever offered the profession and when mixed with equal parts of common lake or builder's sand it is still better. It might be mentioned that this substance was first shown the profession for this purpose at the clinic of the Northwestern Alumni Ass'n. in 1912 and regular use of it ever since makes me enthusiastic over its usefulness. It makes perfect models which seem not to change shape at all and when mixed with sand as suggested it may be swaged upon with impunity either in the hydraulic swager or with the ordinary swager which is pounded with a hammer.

The Author's experience again tallies with my own when he says that cast plates come from the flask both shrunken and warped. And not only has Aluminum done this in my hands but 18 K. gold has also shrunken so much as to be unusable.

The essayist mentioned the expense of using such large quantities of the finer investing materials in casting plates but this can be lessened without harm by using a home made investing material composed of dental plaster, pulverized silica and plumbago flakes—

preferably the flakes rather than the finer varieties. The mixture is to be smeared over the entire surface of the wax with the finger and when both sides are nicely smeared the wax may be entirely covered until nothing shows except the end of the sprues. After this has set it is immersed in water a moment and then the whole invested in the secondary investment as mentioned by the essayist, which secondary investment may be made either of mixed lake sand and plaster or of rather long fiber asbestos to which has been added enough plaster to make it set readily. This latter has an added advantage in that soaking in water a few minutes after the casting is made will so soften the investment that it very readily comes out.

The expense can be still further reduced by buying the asbestos from the manufacturers direct.

Satisfactory plates may also be cast by smearing the wax with the secondary investing material of plaster and sand and then carefully inserting the wax in the compound which has, mean time, been poured into the flask. The wax must in all cases be forced deeply enough into the secondary compound to allow room enough to carve the crucible above it and not come into contact with the wax model itself.

This last method of single investment in the secondary investing material will not give as beautifully smooth surfaces to the casting as will the double investing mentioned by the essayist but will make serviceable plates nevertheless.

But as Dr. Goslee says, a cast plate must be swaged back onto the original model in order to be a good fit and no way of avoiding that has come to my ear up to the present time.

I would like to add that the mixing of lake, river or builder's sand with the ordinary laboratory plaster will much better adapt it to all purposes to which it is admissable.

I thank you for your attention.

DR. GOSLEE (concluding the discussion):

I take it as a personal compliment that I might have the privilege of entertaining so large a number on the last meeting night of the year. I had a purpose in the presentation of this subject. In the minds of most of the practitioners who are at all interested all over the country it is questionable whether to use the direct or

indirect method not only in aluminum dentures but in many other lines of work, and it is also a question as between the relative merits of the swaged base and the cast base. I have made statements on both phases of the subject which I want to see in print, and which I am going to stand back of. There is no question but that there is an element of uncertainty in the casting of large pieces of metal with the technique that we have at the present time, which is more or less imperfect. The indirect method allows us to preserve the original model. Therefore any of you, whether you do your own prosthetic work alone or not, should be interested because you have to take only one good impression and properly prepare it and make one good model, and your dental laboratory will produce a cast base that will fit. If the first one or the tenth one is a failure you still have the original model to work upon. With our present methods of technique there is no absolute certainty and therefore we should make an effort to diminish our failures for the sake of our patients.

Dr. Brophy touched upon a phase of the subject which I desire to mention briefly and that is the disintegration of swaged bases in the mouth. All of us have observed that a swaged base will disintegrate in the mouth in from one to three years, and I have seen them so badly disintegrated that there was no longer any adhesion between them and the tissues. I believe this is brought about by contamination of the baser metals. I have a letter from Dr. W. F. Sharp, of San Francisco, with whom I had a long discussion concerning aluminum bases, in which he says he knows of a cast aluminum which has been worn twenty-five years, and which shows no sign of disintegration of any kind. I have been using cast aluminum for ten years, and I have never observed any disintegration during that time. There is no doubt in my mind but that a cast base is a better base if we can obtain adaptation, and my principal purpose was to call to your attention the fact that we can now obtain correct adaptation. If any of you can do it with any certainty by the direct method it would seem to be the best method, but so long as there is an element of uncertainty let's be certain and eliminate that element.

I want to pay a tribute to Dr. Prothero for suggesting oxychlorid of magnesia. It has given us something we have wanted for a long time—the possibility of an indestructible model.

Just a word or two in reply to another phase of the discussion. Dr. Dittmar has referred to the presence of vents in your mould. The presence of vents can be but for one purpose, and that is to enable you to get rid of the air contained in the mould. I want to say to you that that contained air can be driven out through the porosity of the investment material without any vents. I have eliminated vents, as I have not found them necessary for this size of casting or any other size.

Dr. Arnold says he puts the sprues in this way (indicating). I have never yet seen a pressure or vacuum machine with a flask high enough to take a case in this position and give you a crucible at the top. You must have a sufficiently deep crucible to hold enough metal to fill your mould. And to my knowledge there is no machine or flask that will accommodate a model in that manner. The flasks I have been able to obtain so far have only been about deep enough to put your model in in a horizontal position and then have room enough for the crucible to hold your metal. With the centrifugal machines the crucible is back here, and you have to have the mold on a horizontal line to throw your metal into it. It might be that while whirling it around you would want your metal to come down here and be forced back, in which case such a machine might demand a certain change in the type of sprue formers.

I have tried to give you something which I know to be more or less universally successful, and I am very grateful to you for the manner in which you have received this subject.

THE FIFTIETH ANNIVERSARY OF THE ILLINOIS
STATE DENTAL SOCIETY HELD IN CHICAGO,
MARCH 23-26, 1914.

CONTINUATION OF REPORT OF CLINICS GIVEN BY MEMBERS OF THE
ILLINOIS STATE DENTAL SOCIETY, MARCH 24.

CROWN CLINIC.

In presenting this clinic the committee have endeavored to select the different forms of crowns that are most generally used in the average practice, and will attempt to describe in detail

the root preparation and crown construction, which in their estimation most fully meets all the requirements of a nonirritating, prophylactic and serviceable restoration of a tooth crown.

Before considering any particular crown it will probably be well to mention a few underlying principles that apply to all crown work.

First, A root preparation that will insure a positive seat, and sufficient retention for the crown when set.

Second, Contour—To obtain the proper contour we must strive to reproduce as nearly as possible the natural crown that has been lost. A close study of the remaining teeth should show the type of the mechanical elements, such as plains, surfaces and cusps, and what the function of each may be. If, however, the remaining teeth are in such a poor state of preservation that this is impossible (and it is a lamentable fact that this is often the case) we must use our own judgment as to the proper form. The age of the patient is one of the best guides to go by. A sixteen-year-old tooth would not be efficient in the jaw of an individual forty years old, or vice versa.

A contour, then, must be such as to afford good contact points and yet preserve the normal interproximal spaces. The buccal and lingual surfaces must be so formed as to protect the gingival tissues from the crowding of food upon the gingiva.

The articulation must be so adjusted that the occluding plains of each cusp will get no more than its share of work, and the stress must be directed along the long axis of the tooth.

Since the advent of the cast inlay, the posterior teeth must be quite badly broken down or weakened by previous fillings before crowning is necessary, so we will first consider the construction of an all porcelain crown for a molar (similar to the one presented for your inspection with the different steps in detail). In describing the root preparation fitting the coping, etc., in connection with this crown, we wish to call your attention to the fact that the same underlying principles apply in the construction of practically all the crowns with the exception of the gold shell or cast gold crowns.

The root is finished down to the gum with carborundum stones, the remaining enamel is then removed and the root planed smooth with scalers. The pulp chamber is then squared up to form a flat

seat: in other words, cut out so as to have definite angles and be about one millimeter deep.

When this is done the root is shortened so that the cap will fit under the gum. A safe sided root facer with the center pin cut off, to be slightly shorter than the depth of the cavity in the root is used for this purpose. In cases where on removing an ill-fitting shell crown or a large filling that has failed, exposing carious conditions extending under the gums, this form of root preparation and subsequent method of fitting the cap, is especially applicable. The cap is made of thirty-six gage platinum; the method of fitting is as follows: In the event that the root is broken down and the gum has filled the cavity, the gum must be packed away with gutta-percha for a day or two, in order to get a well-defined impression. The impression is taken with a cone of base plate gutta percha. Then the impression is set down in plaster of Paris, and a die and counter-die of Melotte's Metal is poured. It is an advantage to get a sharp die, and the method of obtaining it is as follows: tepid water and salt, or sulphate of potassium should be used to mix the plaster in order to make the plaster set as quickly as possible; the reason for this being that the moisture is all taken up by the quick chemical action. Put the plaster in a rubber ring and press the impression down deep in the plaster, then trim the plaster smooth around the edges. Next remove the rubber ring part way over the mold and pour with camphor gum smoke, replace rubber ring part way over the mold and pour with clean Melotte's Metal as cold as it will pour, jarring the mold until the metal is set. Paint this die with a mixture of whiting and alcohol and pour counter-die.

This whole procedure must all be done at one time in order to obtain a sharp die, which is only obtainable by pouring the metal over the plaster, while the chemical process is going on in the plaster. The reason for using the carbon is that all white metals cast smoother on a carbonized surface. To clean Melotte's Metal stir a small quantity of resin. Pour the metal into small patties. The dross will remain in the ladle and can be wiped out with a cloth.

On having made the die and the counter-die it will be found a very simple matter to burnish and swedge the cap to approximately fit the root. It is not essential that the metal be burnished over the periphery at this time, only care must be taken not to trim too close

to periphery. The next step is to fit the cap directly over the root. Place the cap on the root, and press to its seat as well as possible with large serrated amalgam instruments, finishing with rapid action engine mallets. This will show the exact outline of the circumference of the root. At this time the excess material should be carefully trimmed off, leaving one-half to one millimeter of a band. Replace the cap on the root and punch holes for the posts that have previously been fitted to the canals. Wax the posts to the cap with sticky wax; then solder them to the cap with as small an amount of platinum solder as possible.

It is not necessary to invest, just press the cap into asbestos (such as specimen), it holds them in perfect relation and saves time of investing. The cap is then replaced on the root and re-seated with mallets, commencing to spin the surplus over peripheral edge of the root. Then with serrated instruments tuck the surplus under the gum to form a band. Then disk the edges of the band down to the amount of lap desired; and a perfectly fitted cap is produced. A plaster impression wax bite is now taken.

To insure against distortion of this delicate cap during construction of the crown coat the posts lightly with wax and the cap with vaseline. Then form a root of cement into the cap; the cap with the root in place may then be put into the impression. Vaseline the root well before pouring the model, so that it can be removed from the model while making crown.

You are now ready for the porcelain. A facing may be used and the crown contour with high fusing body, but the most satisfactory results are obtained in this class of crown by constructing entirely with S. S. White's 2560° porcelain, and not using a facing. The result in a denser, stronger, and better crown in every way. Care must be taken, however, to protect the cap and posts from distortion, due to the shrinkage of the porcelain, where no facing is used. To overcome this it is necessary to brace the posts, where they extend below the cap, by forming a little frame of Iridio-platinum wire (20 gauge) and soldering to the posts. Thick shellac is smeared on the edges of the cap to keep the shrinkage from drawing up the edges. After the contour is practically restored with 2560°—the crown can be finished with a layer of 2300°.

Where the bite is too short for the all porcelain crown, a facing can be used with a cast gold back—so that will be the

next crown considered (similar to the porcelain faced bicuspid presented).

The preparation of the root, fitting cap and etc., is precisely the same as previously described. These crowns are cast, the facing being withdrawn from the wax carving, and graphite points inserted in the pinholes. No special attempt is made to get the gold to cast down over the labial or buccal surfaces of the cap, where the cervical position of the facing rests. In fact, if there is not sufficient bulk of wax to insure accurate casting the wax had better be cut away at this point, so that the gold will not cost over the cap at the cervical. On fitting the facing there will be a space between the facing and the cap; this space may be filled with porcelain when the rest of the crown is finished.

To restore the cervical border with porcelain, coat the part of the cap you want covered with porcelain with flexible collodion (do not use the contractial); this fills up all undercuts and rough places in the cap, leaving a glass-like surface. Vaseline this surface, using as little vaseline as possible; clean the facing with chloroform to cut off all grease, and then with facing in place thin porcelain may be jarred down into the crevices. When the porcelain is very nearly dry the facing may be removed and the thin film of porcelain will adhere to it. After baking it will go right to place, producing a most perfect cervical border.

GOLD SHELL CROWNS.

Where a shell crown is indicated, it is not only advisable to obtain good adaptation of the crown to the cone shaped root at the gingival, but also to the entire length of the cone. Before the advent of casting this was a difficult crown to make, because it was hard to produce the proper contour.

A platinum band is fitted in the ordinary way, festooned carefully, so that it will go under the gum at all points without impinging on the cervical attachment. The band is then cut level with the top of the root, and a platinum floor soldered to it. The contour and occlusal surface can then be restored with wax and cast. This gives a solid form of construction that goes to a

positive seat and a contour that can only be equaled by the seamless method.

BROKEN DOWN ROOTS.

In this class of cases where there has been extensive destruction of the root, either from caries or accidents, and a shell crown is indicated, the first procedure is to pack the gum away with gutta percha, so that the cavity margins are clearly exposed. Then a gold inlay should be made to restore the continuity of the root.

Another class of case where the gold inlay and shell crown go nicely together is where there has been considerable recession of the soft tissues exposing the two buccal roots, of a molar for instance. A gold inlay inserted in the buccal surface of these roots obviates the almost impossible task of festooning a band to the outline of the gums on these exposed roots.

THE CAST BASE PORCELAIN CROWN.

The cast base porcelain crown is indicated for any one, or all of the ten anterior teeth, both upper and lower, where the bite is sufficiently long to permit of a sufficient bulk of porcelain; in fact, this crown may be used for molars also in case of long bite.

In describing the construction, an upper central will be used as the same steps apply to each tooth.

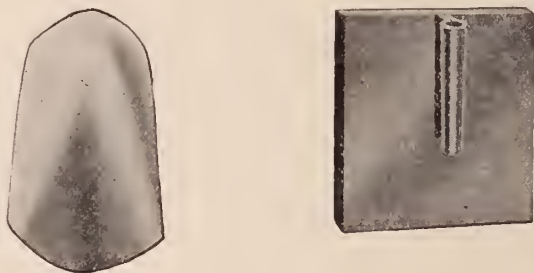
The preparation of the root and fitting cap is virtually the same as previously described. The advantage of first burnishing a thin metal coping, is that it fits the face of the root, and extends just beneath the free gum margin much more perfect than can wax be pressed and fitted there.

With the coping and dowel fitted we now select our porcelain crown, grind it to fit perfectly at labio-gingival and grind so that we have space for a sufficient thickness of wax for casting at all points except at the extreme labial, where we must have porcelain fitted perfectly allowing just the thinnest film of wax.

For the dowel or post which extends up into the counter-sunk portion of the porcelain, we can allow the root dowel to extend up into it, or, if this dowel is not in the correct position or relation we can cut the root dowel down so that it does not inter-

fere, then press the wax into counter-sunk part of porcelain and cast this dowel or post with the base. By casting this post it is possible to place the sprue wire at the end of this wax post, and thus have less metal showing at the lingual of the finished crown than we do where we attach sprue to the lingual part of wax.

When the intervening space between base of porcelain and the thin platinum coping is properly filled with wax we remove porcelain, attach sprue wire and invest coping and wax which are of course sealed firmly together. The case is now heated up for casting the same as an inlay and cast with 22 karat gold, and it is advisable to have the case quite hot when cast to insure good attachment of the gold to the coping.



Cuts No. 1.

The metal is now cleaned, the porcelain portion fitted and cemented to place, the polishing done and the completed cast base porcelain crown is complete and ready for mounting.

The construction of a cuspid Richmond crown using a Steele facing.

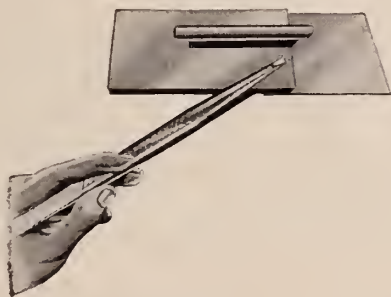
Root prepared—cap and dowel fitted as described.

Select a Steele interchangeable tooth of proper size and shade, and a Steele gold backing to fit it. As the Steele gold backing are of a *uniform 26 gauge* they are preferable to “home made” backings, as you don’t have to depend upon a uniform flowing of solder over them to give them the necessary thickness and strength.

Stick a little wax onto cap and grind the sides and *top* of facing to fit the needs of case. If facing is too long, shorten it by

grinding off top or gingival end, but *don't grind the incisal end of facing*. Grind the gingival end of facing on a slant, so that the labial edge of the porcelain will come in contact with the floor of the cap at its extreme gingival edge only, leaving a "V" shape space between the floor of cap and top of facing.

Slide facing on backing and trim edges of backing flush with the sides and top edge of porcelain where ground, but let



Cut No. 2.

the incisal end of backing extend a little beyond the end of the porcelain. Now remove the facing and to the gingival end of backing, solder an apron of thin pure gold to extend over the gingival end of facing.

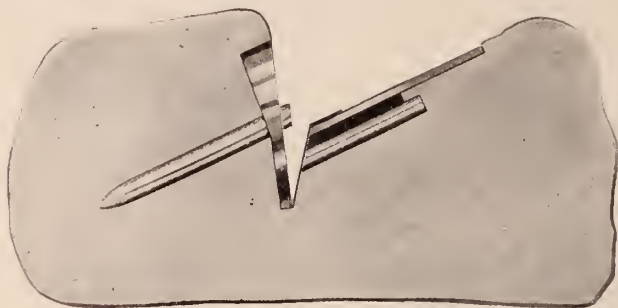
Replace facing on backing and burnish the thin gold over the end of facing, then, with a pair of sharp crown shears and a fine file, trim edge of gold flush with the edge of the porcelain.



Cut No. 3.

Now place facing and backing on the cap and wax it in its proper position with hard wax, in the "V" shape space between cap and backing with wax, which later will be replaced with solder. Remove facing, paint the front of backing and apron with anti-flux and invest with any investment you prefer. Boil out the wax and solder.

Dry out case, heat up solder, using sufficient solder to permit its being ground to restore the lingual aspect of tooth. Break away the investment and clean the crown by heating it a cherry red and dipping into a jar of thirty per cent muriatic acid. Slip on the facing and with a fine file and disks dress down the gold to the desired contour. Leave the incisal edge of gold backing



Cut No. 4.

a little longer than the facing to protect it from occlusal stress. To finish the incisal edge, file on a *slant* from the edge of backing toward the labial edge of porcelain.



Cut No. 5.

THE EVSLIN INTERCHANGEABLE TEETH.

The Evslin facing has a dove-tailed groove which gives added strength because of the large bulk of porcelain through the labial surface.

The groove runs at an angle, thus allowing you to slide tooth on to the backing after same has been burnished or swedged against the bevelled incisal edge. This arrangement allows for the incisal edge being bevelled and protected; same as a long pin tooth.

The protection on the incisal edge on Evslin facings is simplified by using ready-made adaptable backings, which are made of solid clasp metal gold pins securely soldered on to a flexible gold plate of 24K 34-gauge.

The Evslin all porcelain cusp teeth have a dove-tailed groove which runs into the bulky part of the buccal cusp. They can be used to advantage where porcelain is indicated, because they can be ground to fit the case without destroying their strength or aesthetic qualities.

They are given the maximum of holding power by using a



Evslin Facings showing protection of incisal edge—using adaptable backings.

Ready-made adaptable backings for Evslin Facings.

Ready-made adaptable backings for Evslin. All porcelain posteriors.

ready-made adaptable backing which, when burnished or swedged against the tooth, gives you a perfect boxing or cup into which the tooth is cemented.

DIRECTIONS.

Evslin Facings.

1. Grind tooth to fit case then bevel incisal edge same as long pin tooth.

2. Anneal backing, slide tooth on lettered end of backing, then burnish or swedge.

3. If heavy protection is desired, allow backing to extend over incisal edge before investing.

Evslin All Porcelain Bicuspids and Molars.

1. Grind tooth to fit case.

2. Bevel sides of tooth if additional strength in approximal spaces is desired.

3. Anneal backing, then burnish or swedge—thus making a perfect boxing for tooth.

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THERAPEUTIC CLINIC.

ROOT TREATMENT AND FILLING.

Root treatment and filling has been selected as the subject of the clinic in Therapeutics for at least two reasons: First, it is one of the few subjects in Therapeutics that can be demonstrated by means of a table clinic; and, secondly, there is nothing of greater importance in dentistry than the proper treatment and filling of root canals; for upon the quality of workmanship in this branch depends the stability of nearly all artificial substitutes for the natural teeth. The life and service of the beautifully constructed crowns, bridges, anchored plates and other mechanical appliances attached to the teeth from which the pulps have been removed, such as you saw displayed in the various clinics of yesterday and will see again today, are only so long and so good as the *treatment* and *filling* of the root canals.

It is, therefore, of the utmost importance that the root treatment and filling be properly done; and to this end we have outlined a method of procedure that has given excellent results in practice. In this clinic we are presupposing that the pulp treatment has been scientifically and thoroughly accomplished, and that the root canal is ready for filling.

THE PREPARATION OF MATERIALS.

All the materials needed for the filling of the root should be conveniently at hand and ready for use before beginning the work; because it is impossible to maintain the aseptic conditions, so much desired, if during the progress of the operation the dentist has to search through the cabinet for some missing material or instrument and thereby bring to the work new forms of infection.

The gutta percha cones as they come from the manufacturer are not suitable for use in root canals. These cones are made either by hand or machine with little or no attention paid to their sterilization; and even if they were sterile when made they will not long remain so if allowed to lie around in an open box in the cabinet—the way most dentists keep them. Infected cones are a very common means of infecting the tissues in the periapical region, thereby producing alveolar abscesses. To avoid this cause of trouble, sterilize all cones when you buy them in 95 per cent alcohol for ten minutes, dry on aseptic gauze and place in large sterile gelatin capsules, ready for use when wanted. The advantage of the capsules is that the cones may be seen without opening, the proper size selected and then removed without exposing the rest of the cones to more of the germ-laden atmosphere than is necessary. When ready to use cut off the sharp point of the selected cones and place in a small dish of 95 per cent alcohol.

For lubricating the dried canal previous to the insertion of the gutta percha cones, we use eucapercha compound. This preparation is made by dissolving white base plate gutta percha in eucalyptol, to which 3 per cent of menthol and 5 per cent of thymol has been added. This is a solid or semi-solid preparation and should be kept in wide-mouth, glass-stoppered containers, and should never be allowed to remain open longer than is necessary to remove the amount of material needed. Alcohol—two bottles, one of 95 per cent and the other of 60 per cent, should always be at hand; also broaches, barbed and smooth, and root canal pluggers of sizes suitable to the size of the root to be filled. Cotton is another means of infecting root canals if proper precautions are not taken to keep it in an aseptic condition. The cotton as it comes from the manufacturer in cartons is usually aseptic; but it will not long remain so if kept in open containers on the bracket

table or in the cabinet. It should be kept in some form of container with tight fitting cover to protect it from the air when not in use.

The use of rubber dam in the filling of root canals is of the utmost importance. Make no mistake in regard to this. The necessary aspesis cannot be established and maintained by any other means at our command. Before adjusting the rubber dam all debris should be removed from between and around the teeth and the gums and teeth swabbed, flushed or sprayed with a pleasant antiseptic solution. The dam is then placed over the teeth and ligated. The teeth and dam are now washed off with alcohol before the temporary filling covering the last treatment is removed. It is important at this time that all instruments used be sterile; that the operator's hands are in an aseptic condition; that the cotton used in the root canal be aseptic—in short that every thing that touches the tooth or goes into the root canal from this time on be sterile. An aseptic doily should be fastened to the napkin in a convenient place on which the pliers, pluggers, broaches, and other necessary instruments, may be wiped when necessary. With these conditions present we are ready to remove the temporary filling and treatment and proceed with the root filling proper.

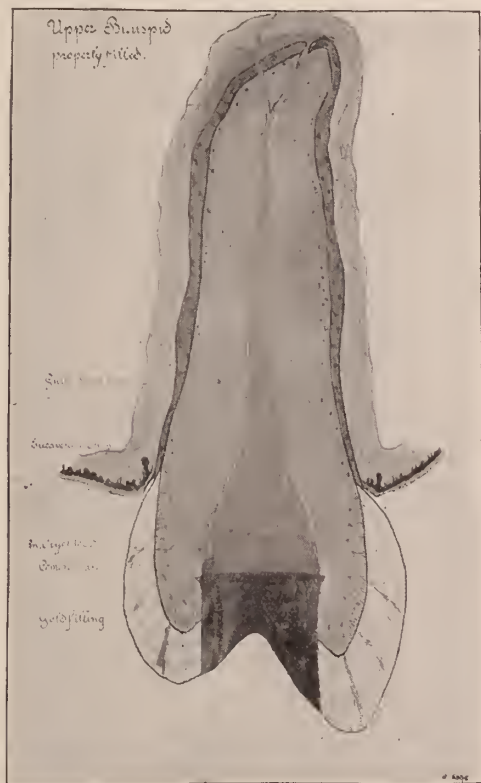
TECHNIQUE OF THE OPERATION.

Upon removing the treatment, carefully go around the walls of the canal with a sterile barbed broach to be sure that no remnants of cotton or other material be adhering thereto. Bathe the canal with 60 per cent alcohol on cotton, wrapped on a smooth broach, and absorb with dry cotton on a broach or evaporate with warm air.

Here we wish to give a word of warning regarding the use of the electric root canal dryers. In our opinion more damage to the tooth structure and pericemental membrane has been caused by over dehydration than by too little drying in root canal treatment. It is not dehydration that we want at all, but simply the removal of the surface moisture. This is also the great objection to the use of 95 per cent alcohol in root canals. Alcohol in this strength has a great affinity for water and abstracts it from the dentin, thereby weakening the tooth structure in much the same manner as is done by the electric or other root canal dryers where

excessive heat is used. In 60 per cent alcohol the affinity for water has been satisfied to an extent and the resulting action is that of a mild antiseptic instead of a dehydrant.

After the root canal has been freed of the surface moisture, a small amount of eucapercha compound is taken up on a smooth broach and worked into the canals until they are filled to the apex. Slight warming with air or touching with a heated plugger



will make the preparation more fluid and more easily worked to the apices of small roots. From the alcohol bath select a gutta percha cone of proper size, place it on a piece of aseptic gauze to absorb the alcohol, and slowly pass the cone into the canal with a slight pumping motion to allow the excess of eucapercha compound to pass around it. Soften the large end of the cone with warm air

and with the pluggers gently condense until the canal is completely filled and there is no more yielding to pressure of the plugger.

In extra large canals two or three cones may be necessary. First one is placed in the canal as far as it will go, soften with warm air and thoroughly condensed, thus filling the apical portion of the root first. Then sections of larger cones are placed in the canal and condensed one at a time until the root is completely filled. Canals that are so small that it is impossible to get a gutta percha cone to the apex may be filled with eucapercha compound, a section of a cone is then placed in the opening, warmed and forced as far as it will go. This will force the eucapercha compound to the apex and make it a very serviceable filling in small canals; but it is not at all permissible in larger canals. In the larger canals if eucapercha compound alone is used the surrounding dentin will not absorb all of the excess eucalyptol, and the filling will remain soft; but if gutta percha cones are packed into the eucapercha compound only a thin film of the preparation remains next to the dentin which readily absorbs the small amount of eucalyptol contained therein, leaving almost pure gutta percha as the root filling. In the very small canals practically the same result is attained. The amount of eucalyptol is so small that it is readily absorbed by the dentin leaving hard and dry medicated gutta percha in the canal.

When the root is filled remove all excess eucapercha compound with cotton and 95 per cent alcohol, and with a hot ball bur-nisher remove all excess filling material from the pulp chamber; after which the latter may either be filled with cement or left as a place of anchorage for the filling as the case may demand. If the latter procedure is to follow the floor of the pulp chamber, or at least the mouth of the filled canals, had better be covered with zinc oxychlorid cement as a barrier to the possible ingress of bacteria while the filling, inlay, or crown is being prepared.

While it is advisable to have the material used for filling root canals medicated to the degree of being antiseptic in character, we wish to state that there is no such thing as a "permanently antiseptic root canal filling material." In recent years too much dependence has been placed upon this supposed and highly ad-

vertised property. No material should be used in this work which cannot be made to completely and thoroughly fill the canals. Any material which does not comply with this important requirement, should be discarded. When the profession fully recognizes the importance of treating and thoroughly filling root canals under as nearly aseptic conditions as are practicable and possible, we will have taken an advance step in the prevention of local foci of infections in the mouth which results in so many systemic disorders. The filling of root canals is the most important work the dentist has to do.

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ORTHODONTIA CLINIC.

The orthodontia section wishing to present something which will be interesting and perhaps instructive, and believing from past experience it would be useless for us to attempt a purely orthodontic clinic, we decided to call your attention to certain malocclusions which are largely due to causes which arise during childhood, with the hope of stimulating the most thoughtful attention and care of the teeth and health of the children of your clientele. As you are well aware, nothing pleases parents so much, nothing will win for you so quickly the friendship of your adult patients as sympathetic inquiry and solicitude for the children of the family. Ask to have them brought to you that you may see if the teeth are coming on all right.

This will give you an opportunity to intimately observe them, and to see if they are not afflicted with one or more of the conditions which tend to produce malocclusions.

First, in regard to adenoids or enlarged tonsils, producing partial or complete stenosis of the nasal air passages, causing mouth-breathing; open-bite malocclusions; inhibited development of the superior maxillae; and often general systemic disturbances, indicating at once that the case should be referred to a rhynologist. In the developed stage of this affliction, the face will often be stamped with that peculiar expression characteristic of this condition; often shown by a pinched appearance of the nose, and with deepened lines and a lack of normal fullness at its base. The undeveloped superior maxilla forces the teeth into decided malpositions for the want of room, while the action of the masseter and buccinator muscles in mouth-breathing tends to narrow the arch and raise its dome. This will often cause open-bite malocclusion with the elongating and narrowing of the features, enhanced by retrusions of the upper lip.

Second, you will have an opportunity to see if the child has fallen into the habit of sucking the thumb. In this action the drawing in of the buccinator muscles tends to narrow the arches, while the pressure of the thumb in the roof of the mouth will in time force the crowns of the front teeth and incisive process forward, without materially disturbing the disto-mesial relations of the buccal teeth. You can effectively stop this habit by placing a straight or curved tube and sliding bar across the arch, one end of the bar and tube being soldered to bands attached to the first deciduous molars. This will prevent the thumb from being placed in the habitual lodgment for action, and will also permit the natural growth expansion of the arch. By threading the bar for a nut, you can also easily expand the arch if needed.

Third. One of the most important things to observe is the mesio-distal occlusion of the buccal teeth, because upon this the occlusion of the permanent dentures are destined to be established. If the deciduous lower buccal teeth close distal to normal about the width of a cusp, the permanent as shown will take the same mal-relations.

Fourth. As the premature loss of the deciduous teeth is one of the most prolific causes of malocclusion, and as this is largely

due to the decay of these teeth, an early examination and treatment calculated to preserve them up to the last moment should be considered of the greatest importance. The most common irregularity which the orthodontist is called upon to treat is that which is characterized by a maleruption of the cuspids. One of the principal causes of this malocclusion is the premature loss of the deciduous cuspids, and while it is not always possible to prevent this loss on account of the too early absorption of the roots, the spaces can always be kept open and enlarged if necessary, with simple appliances. The loss of this tooth will permit the teeth which are distal and mesial to it to drift in and partially or completely close the spaces for the permanent cuspids, which are thus forced to erupt in malalignment.

Fifth, Furthermore, these difficulties are greatly increased, if in connection there is a premature loss also of the second deciduous molars, which will often entrap the second bicuspids; though the main misfortune is, that the stability and guiding force of the deciduous phalynx is destroyed, allowing a variety of malocclusions to develop which threaten to impair the otherwise normal functions of mastication.

If this occurs on the upper or lower alone, the cusps will ride upon, and may even jump the cusps of the opposing denture instead of closing into their normal sulci as they should. And if it occurs upon both the upper and lower, there arises one of the most difficult problems of orthodontia to combat, and one which too often is over-looked because the buccal teeth, possibly on both sides, while retaining their original disto-mesial relations of a normal occlusion are slowly moved forward in phalanx by the oncoming second molars, with the result that if now the front teeth are placed in alignment without forcing the buccal teeth back to the former positions which nature intended they should occupy, there is inevitably a protruding mouth. Prominent teeth, protruding lips with receding chin effects, together with many of the more common malocclusions are at times doubtless due to the failure of dentists to appreciate the importance of saving the deciduous teeth, and especially the second deciduous molars.

Committee.

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Grafton Munroe.
A. H. Murdow.
Benson Sellery.
R. C. Willett.

ORAL SURGERY CLINIC.

This clinic will be limited to an exhibition of methods employed in the treatment of fractures of the mandible. It is intended to exhibit appliances which may be constructed and employed by any dentist. The treatment of the mandible requiring surgical operation is not to be considered. We hope to make plain the technique of the methods employed so as to bring them within the use of every practitioner.

TREATMENT OF FRACTURES OF THE MANDIBLE BY
EMPLOYING THE SWEDGED SPLINT.

BY TRUMAN W. BROPHY.

In this demonstration of appliances for the treatment of fractures of the mandible the authorities of the society have thought best to exhibit only three methods, though there are many other appliances which are most useful. The surgical procedures employed in the treatment of fractures have been omitted.

DIAGNOSIS.

Every practitioner of considerable experience in the treatment of fractures realizes that it is not always easy to make a diagnosis and decide as to whether a fracture has really occurred when it exists at the point of the attachment of the masseter muscle, since the fragments are held in contact by the muscular attachment, and, in patients who are extremely fat or who have broad, thick muscles, little displacement will be noticeable.

The most reliable way of determining the character of the injury in such cases is to secure a good Roentgen photograph,

which will clearly outline the line of fracture and its course. The following are the points to be considered in the diagnosis:

1. Displacement of the fragments.
2. Mal-occlusion of the teeth and abnormal alignment, with apparent loosening of certain teeth which are not necessarily loose, but move with the fragments.
3. Crepitation.
4. Swelling.
5. Pain on motion.
6. Tenderness on palpation.
7. Laceration of the tissues at the end of the fragments with hemorrhage.
8. Injury to the mandibular vessels and nerves, resulting in hemorrhage and loss of sensation.

APPARATUS FOR TREATING FRACTURE.

To secure union of the fragments of fractured bones and restore the parts to a normal condition requires the use of mechanical devices so employed as to meet the requirements in individual cases. In fracture of the maxillae and mandible it is essential to bring about a union of fragments in such a way as to restore normal occlusion of the teeth. The aim, therefore, should be to get a union with correct occlusion of the teeth. If this be done, a perfect cure of the fracture will be effected.

When visiting a patient for the first time, who has sustained fracture, a diagnosis of the character of the injury should be made first, and the extent and displacement of the fragments should be clearly understood. Having, by the use of ocular examination, digital manipulation and the Roentgen ray, decided as to the condition of the parts, the next step will be to decide upon a course of treatment adapted to the case the kind of apparatus to be employed, etc.

As in the treatment of all fractures, we desire to place the fragments at the point of separation in correct proximity and so retain them in quiet contact until the process of repair is complete. The means to be used to secure such a result are:

THE SWEDGED SPLINT.

This is obtained by having the plaster cast made of all the lower teeth. It is divided at the point of fracture; the plaster teeth brought into correct alignment; the die and counter-die in cast metal—German silver, platinum or gold, preferably platinum or gold. Swedged to fit the metal teeth correctly and then tried in the mouth to see that the relation of the metal to the natural teeth is correct. This done, the teeth should be thoroughly washed and cleansed with alcohol, dried, and the splint firmly cemented in place with oxyphosphate of zinc cement. Care must be taken to fix the fragments in the splint in such a way as to secure the correct alignment of all the teeth, for it must be remembered that successful treatment is dependent upon restoring and maintaining correct occlusion of the teeth.

Immediately after placing the splint in position and while cementing it to the teeth, an assistant holds the splint and the short fragments down while the surgeon carries the long fragment upward. Thus the long fragment is forced up, bringing the lower into contact with the upper teeth, separated only by the thin metal strip. Before the cement hardens, a burnisher is employed to force the metal between the teeth, both buccally and lingually. The parts are held in place firmly and so maintained until the cement has hardened. After that, the excess of cement should be removed.

WIRING THE TEETH OF THE MANDIBLE TO THOSE
OF THE MAXILLA IN THE TREATMENT OF
FRACTURES OF THE MANDIBLE.

BY THOMAS L. GILMER.

All fractures of the mandible, except those which are edentulous, may be immobilized by wiring the lower teeth to the upper. While this statement is true, it does not necessarily follow that it is the best means of treatment for all fractures of the mandible. Some cases may be quite as well treated by other methods with less inconvenience to the patient. However,

there are, on the other hand, some fractures of the mandible which cannot possibly be so well treated by any other means. For instance, fractures posterior to the first molar. Splints are not applicable to fractures of the angle or in the ramus, or to fractures of the neck of the condyle.

The advantages which lashing the lower to the upper teeth in the treatment of mandible fractures are—the ease with which this method may be applied; the facility of its application; the positiveness of perfect alignment, thereby securing perfect occlusion of the teeth with positive fixation of the fragments in apposition; and it always permits the surgeon to see whether the occlusion and alignment of the teeth of the broken jaw is perfect. All of these are factors well worthy of consideration.

The objections to the method are trivial as compared with its many advantages. The principal objections are the absolute fixation of the mandible, so that the patient cannot open the jaw; the difficulty of cleansing the lingual surfaces of the teeth; and the danger of strangulation in case of emesis. The latter objection is more fancied than real, since the stomach usually contains no solid food a few hours after the accident and the jaw should not be fixed until the stomach is emptied of food of this nature.

There is no difficulty in feeding the patient liquid and semi-liquid nourishment, since after a few hours following the fixation of the jaws there is sufficient give in the wires to permit the teeth of the mandible to separate from those of the maxilla. This permits the taking of liquid food. This slight opening of the bite does not in the least prevent good occlusion of the teeth when the bones are united. Complete fixation of the fragments is not essential after a sufficient callus is formed, and under favorable circumstances this will take place in two weeks' time, when the wires may be removed. Usually no appliance is necessary after this period, indeed calcific deposits are hastened by the normal movements of the mandible. After removal of the wires no food should be taken which requires mastication, and the patient should be frequently examined to discover if there is change in the occlusion. If the alignment changes from the normal the wires should be replaced for a time.

While the jaws are fixed by the wires the teeth should be carefully brushed on their exposed surfaces and the interproximal spaces cleansed by frequent irrigation using a bulb syringe. By this means the mouth may be kept reasonably clean.

Any kind of strong, pliant wire may be employed for fixation. The wire used by the orthodontists answers a good purpose. Wires should encircle and be secured to a sufficient number of solidly fixed teeth in each jaw to hold the teeth of the mandible solidly against the teeth of the maxilla. No wires should be secured to the teeth next to the fracture, or any others which may have been loosened by the accident or otherwise. The wires fixed to the teeth of the mandible should be secured to those of the maxilla by twisting until the occlusion is made perfect. That there may not be too direct pull on the teeth by the lacing of the lower teeth to the upper, the wires should cross, from say, a lower first bicuspid to an upper second bicuspid. This method of securing the lower to the upper wires also prevents lateral or side motion and more securely fixes the jaw.

When the teeth are not well set in the jaws and there is much displacement with great muscular tension, heavy wires such as used by orthodontists for expanding the arch, are securely wired to the buccal and labial surfaces of both the upper and lower teeth and the fracture reduced by securing the lower heavy wire to the heavy one above by a smaller wire. This method may be used in all cases of wiring the lower to the upper teeth. It has the advantage over the older method in that it puts an equal strain on all of the teeth.

TREATMENT OF FRACTURES OF THE JAWS USING THE METAL SPLINT WITH BANDS.

FREDERICK B. MOOREHEAD.

This is probably the simplest and most satisfactory of all the splints used in treating fractures of the jaw. Its application is certainly more universal than any other, as it may be applied in nearly every case where the break is anterior to the second molar.

When properly made and properly adjusted, it insures a satisfactory anatomical and physiological result.

During the process of repair the patient has the full and free use of his jaw and may eat any reasonable article of diet. To construct it requires no special skill or equipment.

TECHNIQUE.

Fit bands on at least two teeth on each side of the fracture, omitting the tooth or teeth involved in the break if possible; e. g., if the fracture should occur between the first and second bicuspid, place bands on the first and second molars and on the cuspid and lateral incisors. For this purpose, the usual regulating band material made of German silver may be employed. Pinch the band material around the teet selected, burnish to fit the tooth, remove and solder. Place bands on the teeth and take an impression in plaster if possible. Run model, using a material which will stand the heat of soldering. When the model is made, with the bands in position, fit and solder a rigid metal bar on the lingual surface, and one on the buccal or labial surface. These bars should be molded so as to fit in between the teeth as far as possible, else they will interfere with the tongue and cheek. The bands should also be soldered together at points where they come in contact.

The appliance should be carefully finished and polished, and may be plated if desired. The appliance should be carefully fitted to the teeth, and, if satisfactory, cemented in place.

The rubber dam may be used at the dentist's discretion. Where there is much displacement, fit the bands and proceed as described. When the model has been made, cut through with a saw at the point of fracture and articulate with a plaster model of the maxilla.

The divided model may be united with plaster and the bars fitted as described. When the appliance is cemented in place, the patient's jaws should be closed, while the cement is still soft to insure perfect occlusion.

In simple fractures the appliance should be left on three weeks. In compound fractures, from five to six weeks, or even longer when the infection is not easily controlled.

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REPORT ON ANESTHESIA AND ANALGESIA. INTRATRACHEAL ANESTHESIA IN MOUTH SURGERY.

BY THOMAS L. DAGG, M. D., ANESTHETIST TO ST. LUKE'S HOSPITAL.

To provide a perfect and even anesthesia for prolonged operations within the mouth and particularly where resection of bone is concerned and excessive hemorrhage to be anticipated, is a problem for the anaesthetist to meet by some procedure other than the old time face mask and ether drop or chloroform method, when for instance the patient is first saturated with the anaesthetic, then the mask withdrawn and the surgeon begins to work; after a few minutes operating, and always at a critical moment when possibly an effort is being made to control an obscure hemorrhage the patient begins to react, the surgeon becomes impatient, the anaesthetist shows a nervous anxiety to get back on the job with his ether mask but is excluded from the field by the busy hands of the surgeon and two or three assistants trying to stop a hemorrhage, while the patient himself meanwhile is squirming and coughing and choking in his own blood, making everything impossible except confusion, and very often disaster results; and all due primarily to an improper method of anesthesia in these particular cases.

I wish to state right here, however, that I am first, last and all the time, in favor of Gas and Oxygen as a routine anesthetic in every case where it can be properly used; and I am opposed to the use of any anesthetic drug where it is not necessary; and this applies to ether and chloroform especially.

I have stated elsewhere my reasons for believing these drugs harmful; but in a nutshell, Ether, Chloroform, Alcohol or any other drug when used to the point of intoxication is harmful; and when, as in anesthesia, ether or chloroform is used to such a point of intoxication as to render a person unconscious by paralysis of the central nervous system, requiring days to eliminate it from the system and weeks to recover from it, then I say it's time for us to give those drugs the "go by" when we can accomplish the purpose of anesthesia by such a harmless substance as Nitrous Oxide Gas and Oxygen.

But since the case in point is not one where Gas and Oxygen can be used owing to the fact that air can not be excluded in its administration in these cases, then we are obliged to accept the next best thing, Ether, as a substitute.

I have used the various methods of administering Ether in these cases, including, 1st., the old time honored mask. 2nd., by conducting ether vapor into the mouth through a tube producing the vapor by means of a foot pump or compressed air. 3rd., the intra pharyngeal method, by forcing ether vapor into the pharygeal chamber through intra nasal tubes. 4th., and finally by the intra-tracheal method, first introduced by Meltzer and Auer, by passing a catheter directly into the trachea to a point just short of where the bronchi begin, and supplying ether vapor in definite quantity of saturation and by definite positive pressure as controlled by a manometer attachment. I prefer a 22 F. semi flexible linen catheter for this work, since the chief difficulty seems to be in introducing the tube. At first I used the Jackson laryngoscope for introducing the tube, but latterly I find it can be done just as readily by touch, guiding the end of the catheter into the glottis by the end of the second finger, using the index finger to draw the epiglottis forward and steadying it. An assistant must draw the tongue well forward and the patient, who is first deeply anaesthetized, is drawn over the end of the table so as to extend the head thus giving a more direct line of entrance from mouth to tracheal inlet.

The chief advantages of this method I believe to be 1st., in the more perfect control of the patient by the anesthetist; the anaesthesia can be maintained while the surgeon works. 2nd. The air that is carried into the trachea through the tube of course finds

an exit between the tube and the tracheal wall; and as this current of air is constantly coming out of the trachea it serves a very valuable purpose in preventing blood or mucus from going into the trachea and thus interfering with respiration. 3rd. It avoids the necessity of a preliminary tracheotomy. The nasopharyngeal cavity can be packed off,—not tightly but loosely, and as the gauze becomes saturated with blood it should be removed and renewed. 4th. The amount of ether used is less than by any other method, although the amount assimilated by the patient may be the same. Some special apparatus is necessary for this form of anaesthesia. Since we have to force air into the lungs by means of a pump, it is important to know how much force we are using; as otherwise damage to the lungs may be done by too much positive pressure. Therefore an Ether container with a manometer attachment is necessary for such work.

There are many apparatuses on the market. I use one brought out by Robinson of Boston. But there are no doubt others more simple in construction and just as reliable.

RELATIVE SAFETY OF ETHER AND CHLOROFORM.

BY ISABELLA C. HERB, M. D., CHICAGO, ANESTHETIST TO THE PRESBY-
TERIAN HOSPITAL. INSTRUCTOR IN ANESTHETICS,
RUSH MEDICAL COLLEGE.

Since the death of a woman three months after the introduction of chloroform as an anesthetic agent the relative safety of ether and chloroform has been the subject of many heated controversies which have usually consisted in the recital of personal experiences. Unfortunately it is difficult for many people to eliminate prejudice and the subject of the relative safety of the different anesthetic agents, like many others, was not put on a firm basis until the establishment of research laboratories, wherein trained investigators attack problems from a purely scientific standpoint. Clinical conditions have been reproduced experimentally and the pathological changes studied microscopically and chemically. While the statement "the danger lies in the anesthetist, not in the anaesthetic" undoubtedly is true to a certain extent, there can no

longer be any question regarding the relative safety of ether and chloroform even in the hands of the most careful and expert anesthetist. It is not possible in the space allotted me to deal exhaustively with the subject. I will, therefore, simply call your attention to a few important points.

Statistics relative to the safety of the different anesthetic agents are not perfectly reliable and yet are valuable as roughly indicating the relative risks. The committee of the Royal Medical and Chirurgical Society studied 210 chloroform fatalities with the following results:

Sex	Age
Males150	Under 5 yrs..... 2
Females 59	6-15 yrs..... 21
Not stated 1	16-30 yrs..... 49
	31-45 yrs..... 37
	46-60 yrs..... 3
	Not stated..... 45
	210

Stage of anaesthesia

Before full effects of chloroform.....	93
During full effects.....	68
After operation	31
Not stated	18

210

Dr. Julliard of Geneva collected from various reliable sources 839,245 ether and chloroform administrations and published the following table:

Anaesthetic employed	Total number of administrations	Total number of deaths	Death rate
Chloroform	524,507	161	1 in 3,258
Ether	314,738	21	1 in 14,987

Dr. Ormsby of Dublin recorded the following.

Chloroform	152,260	53	1 in 2,873
Ether	92,812	4	1 in 23,204
Ether and chloroform	11,176	2	1 in 5,558

From the above statistics it is evident that under ordinary circumstances ether is about seven times as safe as chloroform and therefore without special indications it is morally incumbent upon the anesthetist to employ ether. However, there may be special conditions which justify the use of chloroform for routine work. For instance extremes of temperature may render the use of ether impossible. In extremely cold climates it is difficult to vaporize ether sufficiently rapidly to produce and maintain narcosis. On the other hand ether boils at a temperature of about 95° F. Consequently it may be impossible to employ it in tropical countries.

It has been shown experimentally that sudden deaths from chloroform are usually due to a too concentrated vapor. The danger zone for chloroform is a narrow one and haste during induction or narcosis with a vapor greater than 2 per cent doubtless is responsible for the early arrested breathing and acute dilatation of the heart before any fall in blood pressure has taken place. Deaths which occur sometimes after narcosis is established are probably due to a lowered blood pressure which causes anaemia of the respiratory center and arrest of respiration which leads to pulmonary engorgement and over distention of the right heart with cardiac failure. The danger from chloroform does not end with the anaesthesia but "delayed chloroform poisoning," "acidosis" or "acid intoxication" may develop several hours later and cause death. Extensive fatty changes occur in the liver, kidneys and heart muscles, the liver being especially involved with wide-spread necrosis resembling acute yellow atrophy. Death usually occurs about the third day but recovery may take place if the injury is not too severe.

The danger zone for ether is a much wider one than for chloroform,—hence its greater safety during induction and maintenance of narcosis. Contrary to chloroform it stimulates the heart's action and raises blood pressure. Since the introduction and perfecting of vaporizing apparatus the field of usefulness for chloroform has been still further restricted. Operations in and about the mouth and throat, for which chloroform was formerly given, may now be performed under ether anesthesia with perfect satisfactory results so far as operative requirements are concerned and with infinitely greater safety to the patient.

LOCAL ANESTHESIA.

BY HERBERT POTTS.

The application of drugs to skin and mucous membranes for the alleviation of pain consequent to surgical operations is as old as surgery itself, but the abolition of such pain is of recent date.

In 1866 an advance was made by the use of highly volatile drugs which had when used as a spray a very refrigerating effect.

This process was used quite extensively until 1884 when Koller introduced the use of cocaine which marked the real advent of local anaesthesia.

The number of deaths occurring from its use led to investigation and study by many men, chief among them were Schleich and Reclus who introduced the infiltration method by which means weaker solutions were used.

Intoxications were still encountered and were further reduced in number by the addition of the extract of supra-renal capsule as recommended by Braun, this not only enhanced the anaesthesia making a bloodless field, but made possible the use of still weaker solutions and retarded to a marked degree the absorption of the drug. This slow rate of absorption being the principle factor in avoiding intoxication.

Further, the synthetic preparation of cocaine substitutes has reduced the toxicity of local anesthetics to a minimum degree, the consensus of opinion is that Novocain combined with supra-renal extract in an isotonic salt solution is the least toxic and most ideal of local anaesthetics.

The rapid improvement in technique has been remarkable in that use of a local anesthetic, at first confined to operations upon mucous membranes and skin, now makes possible the performance of most operations, which before required a general anesthetic, lack of knowledge regarding its use alone being responsible for its lack of use by general surgeon.

Still another great advance has been made by Crile, who has proven beyond a doubt that operating upon an anesthetic field even under a general anesthetic is a life saving measure in that is avoided, wounds heal more readily and the reparative processes

are more quickly established in an area which is cut off from cerebral or cortical influence, the part being anesthetic no impulses are carried to the brain, which is the real seat of pain. The part operated upon is anesthetic not only at the time of the operation, but by the use of Urea Hydrochlorid and quinine also injected into the parts the area remains anesthetic or at least analgesic for two or three days.

It has long been known that traumatism to large nerve trunks is conducive to shock and that by injecting a local anesthetic into a nerve trunk before cutting it a certain amount of shock can be avoided.

How much more potent then are drugs, the proper use of which not only relieve pain during operation, but allow subsequent dressings to be accomplished without pain and facilitate repair by cutting off cerebral influence upon trophic centers.

Any drug for injection must be sterile and as nearly isotonic as possible, the syringe and needle likewise.

The needle should be of sufficient length and of small calibre, preferably with a short bevel point which when used, to infiltrate bone, should be introduced with the bevel next to the bone, otherwise the point will stick into the bone and cannot be well passed along its surface.

The area at the point of injection should be sterilized by tincture of iodine.

Tissues may be infiltrated as by the Schleich method if they are not inflamed; if they are the conductive anesthetic may be employed, frequently a combination of the two will yield the best results.

The whole mandible may be anesthetized by injecting the nerve trunks as they enter the inferior dental foraminae and the branches of the buccinator which may be encountered beneath the mucous membrane below the salivary papilla.

The upper jaw may be anesthetized by injecting the second branch as it leaves the foramen rotundum.

For operations of less magnitude the maxillae and mandible may be infiltrated by slowly injecting beneath the periosteum choosing for the site of injection those portions of the bone which have a more or less porous surface which blood vessels traverse, a

study of the bones will make that point clear.

Dosage commensurate with the method used be employed and less supra-renal extract used in children and arterio-sclerotic subjects, but where one cubic centimeter of a one to one-thousandth solution may be used to relieve the spasm of asthma one may have little fear of the amount used in local anesthetics.

Scheff has shown that Novocain supra-renal solution does not endanger the lives of pulps of teeth.

Secondary hemorrhage at times occurs, this may be avoided by using also a one-half or one per cent solution of Urea-Hydrochlorid and quinine solution which produces fibrin and some oedema thereby preventing such a complication.

Capsules of the solution or tablets which may be boiled are most convenient and yield accurate dosage.

Soap or alkalis destroy the active principles of both Novocain and supra-renal extract and can be eliminated by adding two drops of dilute hydrochlorid acid to one litre of physiological salt solution, this being used to dissolve the tablets.

A sufficient time should be allowed after injection for the action of the drug.

The induction of local anesthesia is an art requiring study and a knowledge of the minute anatomy is essential.

Committee.

H. A. Potts,
Chairman.

Louis Schultz.
P. G. Puterbaugh.

PUBLIC SERVICE IN ILLINOIS.

The matter of Public Service by the dental profession is a comparatively old one in Illinois. As far back as 1900 the subject began to be agitated, and from time to time has been brought up until about 1910 endeavor was crystalized and definite action taken.

In 1900 the Odontographic Society, then Chicago's strongest dental society, taking cognizance of the work being done for school children by the dentists in many foreign countries, and especially that of Dr. Jessen in Strassburg, asked to be permitted to examine the teeth of some of the public school children with a view to determining how extensive were the ravages of decay, and in an effort

to plan for the alleviation of the destruction. Apparently public opinion had not reached the proper state—the time was not ripe and this permission was denied the dentists. This was before school medical inspection had become an established factor in this state or city. Dr. C. E. Bentley was Chairman of this Committee.

While from time to time in the State Society's meetings mention was made in the President's address or elsewhere, of the duty the profession owed to the laity in this matter, year after year passed with no definite progress made.

In 1907, in Chicago, an epidemic of scarlet fever made it possible for the Department of Health to institute school inspection almost overnight. Alarmed by the spread of the disease, the city council made an emergency appropriation and the department was enabled to stamp out the spreading contagion.

Having once gained this ground the Health Department has never lost it, and although the number of inspectors was decreased after the urgent need for them had passed, school medical inspection has continued ever since, with more or less active support on the part of the city fathers.

Following this in 1910 the matter of school dental inspection and clinic work was again brought up. The Englewood Society in cooperation with the United Charities instituted a dental clinic at the Stock-Yards United Charities Center (Apr. 1910). At about the same time (May, 1910) the Odontological Society approached the Board of Education with a request for permission to examine children's teeth and to open a school clinic. Following this the Chicago Dental Society joined hands with the Odontological, appointing the Public Service Commission of the Societies, with Dr. C. N. Johnson, as Chairman.

The request of the Societies was unhesitatingly granted, the movement having the support of the Superintendent of Schools, the Commissioner of Health and the President of the Board of Education; and the 93rd St. School in the steel mills district, in South Chicago, a school then recently vacated as a high school, and converted into a grammar school, was designated as the location for the clinic.

Here in September, 1910, were installed two complete equipments donated by the dental supply houses, the Board of Education paying the cost of plumbing, wiring, etc., and the clinic was manned

as was that of the Englewood Society by volunteers from the profession. Coincident with the beginning of this work inspection was inaugurated and of the first 600 children examined 97% were found to have defective teeth in need of dental attention.

The showing made was taken so seriously by the Commissioner of Health that the following April (1911) provision was made for the addition of a dentist to the staff of the Bureau of Medical Inspection, and plans were laid for the immediate inspection of "all the children of all the people" in two months. Of course we fell far short of that, but of the 400,000, some 10,000 were examined and records made.

In May, 1911, the Illinois State Society, keenly alive to the progress of the movement for "Good teeth—good health," and, inspired by the address of Dr. Gallie, appointed the Committee that has so thoroughly justified its existence—the "Public Service Committee," with our present president as Chairman. The work has been carried on since as then planned. Meetings have been held throughout the state, in which the co-operation of the medical and educational authorities and professions has been sought and obtained. At each of these meetings a well prepared lecture has been delivered by a speaker provided by the committee. The lectures have been addressed to school children and parents alike, and a vast amount of good accomplished in spreading the doctrine of oral cleanliness and tooth salvation.

A campaign of public instruction through the medium of newspaper articles was carried through under the direction of Dr. Warner, and much good accomplished. Articles selected for their value were distributed to various papers throughout the state that were willing to publish them as a matter of interest to their readers.

The Public Service Committee, during 1911-1912, held twelve meetings in the following cities: Rockford, Bloomington, Monmouth, Rock Island, Carmi, Joliet, Urbana, Paris, Dixon, Edwardsville and Belleville. A booklet prepared by the society on "Care of the Mouth" was distributed at these meetings. The total attendance was about 8,000.

In Chicago, during this period, volunteer inspection had been continued, and two additional clinics opened, those at Mark Sheridan and Montefiore schools, the funds being provided by interested

laymen. About this time a dispensary was opened at the Gault Court, McCormick Fund School for tubercular children.

In 1912 the Public Service Committee, with Dr. Logan as chairman, acquired the film "Toothache," produced through the efforts of the National Dental Association Oral Hygiene Committee, and this has been shown at a moving picture theater coincidentally with the giving of the Mouth Hygiene lecture. During 1912-1913 eleven lectures were given to a total audience of over nine thousand, and the film was viewed by 24,000 people. The following cities held lectures or produced the film: Tuscola, Streator, Springfield, Chicago, Joliet, Morris, Kankakee, Quincy, Cairo, East St. Louis, Sterling, Peoria, Belleville, Sheldon, and Rockford.

Early in 1912 it began to be apparent that the three school dispensaries in Chicago, manned as they were by volunteers, were entirely inadequate to take care of the remedial work. Mr. Julius Rosenwald became interested in the work being done and after going over what had been accomplished, volunteered to equip additional dispensaries to bring the number up to 10, and to pay the salaries of 10 operators at \$100 per month for the 10 school months of each year, until such a time as the city was ready to assume this as part of its activities.

This was a radical step forward, and in Chicago it was felt that we were really accomplishing something definite. The work has continued in this way up to the first of this year, 1914, when the appropriation in the budget, for the dental dispensaries was passed with a slight reduction and the work turned over by the Public Service Commission to the Health Department, where it is included in the Division of Child Hygiene.

In February of this year an additional dispensary was opened at Moseley School, the equipment being loaned by the McCormick Fund, and the salary of the operator coming from Dr. W. V-B. Ames. This and the Stock Yards dispensary have not been assumed by the city.

During this last year the State Society's Public Service Committee has continued its lecture work, lectures having been given at Decatur, Anna, Freeport, Bloomington, and Danville,^a and the film shown at these places, and also at Peoria, Paxton, Monmouth and Galesburg. About 15,000 people have viewed the film during this year.

The film has also been shown in Chicago and suburbs under the auspices of the Chicago Tuberculosis Institute, and under the direction of the various local societies.

School dental inspection has been begun in Cairo, Kankakee, Morris, Freeport and Aurora and is about to be begun in Decatur.

In Chicago various additional activities that have been outlined have been dormant because of lack of funds. An experimental class of fifty with a control class of equal number has been considered, and a series of scientific tests determined upon. It is our hope that this will soon be a reality instead of a prospect.

The educational feature of the work has not been given its due consideration for the same reason. Lectures and instruction in the schools have been carried on to some extent, but not to our entire satisfaction.

Of the children examined over 95% have been found defective. During the school year 1912-1913, of 22,671 examined, 21,686 were found defective. During the year 1913-1914, to date, there have been examined 20,567, of whom 20,086 presented defects. The total number examined up to the present time is 82,614, of whom 78,537 were defective.

During the school year 1912-1913, 41,925 operations were performed in the school clinics. Of these 18,457 were treatments, 13,296 fillings, and 10,157 extractions. Exclusive of emergency treatments 3,497 children had work completed.

During the year 1913-1914, to March 1, there have been performed a total of 44,326 operations, of which there were 22,249 treatments, 11,008 fillings, and 9,069 extractions. Porcelain crowns to the number of 58 have also been set in the last two years.

The dispensaries now in operation in the order of their accessibility from the center of the city are these:

Moseley—Twenty-fourth street and Michigan avenue.

Montefiore—Grand avenue and Sangamon street.

Franklin—Wells and Goethe streets.

Mark Sheridan—Twenty-seventh and Wallace streets.

Jirka—Seventeenth and Loomis streets.

Hammond—Twenty-first place and California avenue.

Morse—Sawyer avenue and Ohio street.

Stockyards United Charities—Forty-seventh street and Emerald avenue.

Hamline—Forty-eighth and Bishop streets.

Langland—Cortland and Leavitt streets.

Ninety-third Street—Ninety-third street and Houston avenue.

Kohn—One Hundred and Fourth and State streets.

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INTERNATIONAL DAY CLINIC.

The magnitude of the "International Day" clinic, held on the first day, in both the forenoon and afternoon, was such that it is impossible to do justice to the clinicians in describing it on paper.

The only way that one could appreciate its true worth would be to have been present and to have witnessed it. Here were grouped nearly one hundred and seventy-five men from almost every state in the Union, from Canada, from England, France and Japan; each demonstrating the best their respective state or country had to offer for the advancement of dentistry. At one table, near the entrance to the large banquet hall, where the clinic was held, the spectator would see beautifully carved and cast gold inlays; and then as he thought this was surely ideal, he would turn to another table only to see equally beautiful work done with amalgam. With this confusion in his mind, he would slowly wedge his way through the crowded room, where he saw every phase of dentistry demonstrated, from the results of the X-ray and the filling of root-canals to the minutest details of all kinds of operative and prosthetic procedures.

Surely this was a great clinic and it far exceeded the fondest hopes of those having it in charge. It can be safely recorded in the annals of our society that this was the greatest dental clinic of its kind ever held under the auspices of a state society. Reports of the individual clinics were impossible to obtain under the circumstances.

THE FIFTIETH ANNIVERSARY OF THE ILLINOIS
STATE DENTAL SOCIETY HELD IN CHICAGO
MARCH 23-26, 1914.

DISCUSSION ON THE REMARKS OF DR. WHITE ON ORAL HYGIENE.

DR. LEONARD G. MITCHELL, Oklahoma City :

This subject cannot be handled as it should be in the few minutes allotted, so I must hurry along even though I am abrupt.

I am proud of the progress we have made in our city because we are so far West. This movement had its start in the East and drifted Westward. We are trying to keep our City up with Eastern as well as Western States. We have with us in our State Department a young woman whom you heard in Kansas City last July if you attended the Oral Hygiene Section of the National Dental Meeting. Miss Erma Matthews has done more for oral hygiene in our State than all the dentists put together. Briefly, I will say, that in her work over the state in organizing women's clubs, she has reached nearly all of the school children throughout the entire state. She has induced the state superintendent to issue orders to all county superintendents to allow a grade of three per cent on oral hygiene, and two per cent on general hygiene. You know what that means. If a child makes one hundred per cent it must have clean teeth, and it also means in order to have clean teeth they must use the tooth brush regularly. The heart of this young woman is in this great work, and she is reaching thousands of school children, carrying the gospel of mouth hygiene into the rural districts, doing much good. Unfortunately for us but fortunately for one of our bright young men, she has recently married, which will probably curtail her work somewhat, yet she will continue some of this very efficient work.

In our city campaign we started first by interesting the school board and superintendents of our city on the needs of mouth hygiene. Then we examined all of the pupils of the fourth, fifth, sixth and seventh grades, in four of our schools. We had expected to get enough children in one school, but found through the efforts of the medical inspector, the children's teeth were in better condition than in some places we know of. So we kept on

with the examinations until we examined all children of these grades in these four schools. From these we selected thirty-five of those mouths who presented the worst conditions. We then had a psychologist from the State University conduct a series of tests two weeks apart in order to get a fair average. Five dentists proceeded to put the mouths in as perfect condition as possible. After getting the work well in hand, we invited dentists of the local dental society to present the subject of mouth hygiene to the school children. Fourteen accepted the invitation; we arranged the schools and dentists alphabetically. These men prepared themselves, went to the schools, and presented mouth hygiene in as simple terms as possible. We had two and sometimes three rooms thrown together to economize time. The results so far obtained have justified the time we have given to it. We are also presenting this subject before the school patron's clubs. The man to whom a school is assigned is invited by the principal to appear before the patrons' club and present mouth hygiene to the mothers. We also have meetings at night so that we can talk to the fathers of the children as well.

There is one thing I would mention, and that is, if you can keep the fact that you are a dentist from the people in order to disarm them of the idea that there is a mercenary motive back of it, you will accomplish a great deal more. When we are introduced to the school children or patrons' club, or one of the federated clubs, the name of the speaker is not mentioned. It gives us a splendid opportunity in the course of our talk to explain why and it makes a hit.

So I would suggest that those who are not working in this line, but who expect to do so, follow this plan.

One of the most important phases of Oral Hygiene work is publicity, but unfortunately we cannot have it because of the jealousy which has crept in. We cannot publish a single item in the newspapers on account of this. The papers are anxious to publish everything we might give them. For the sake of harmony we have to pay that price. I hope the time will soon come when that can be changed. So if you men are interested in school children in your home cities, lay your plans so as to head off this feeling by keeping your names out of the papers. The idea is to give the

newspapers the information they wish in regard to this matter, but make them keep the names out. Ask the newspapers to co-operate with you, to head off the feeling that seems to be a natural one, so that the school children may receive the greatest benefit from this work.

We hope to prove as we have learned this morning that it is a great economic question for tax payers. That has been established or proven already. Unfortunately the people are Missourians; they are not willing to accept the results from other cities where the value of this work has been demonstrated, but they want to know for themselves, and we are trying to show them. When we have the final psychological tests made and also show the improvement in the class grades that will accrue from this work, we hope the city will take some action and employ a trained nurse to do much of the work that the dentists are now doing. We hope to have clinics established, but until then, we have agreed among ourselves to do all the work for the poor children of our schools.

There are other things I would like to comment on, but there is no opportunity to do so at this time. We have other men present who can enlighten us in regard to these matters. In the few remarks I have made I have attempted to point out to you the progress we are making in Oklahoma City. (Applause.)



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Devoted to the Advancement of Dental Science,

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EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

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EDITORIAL.

FADS.

Fads are useful, but precarious. In dentistry we have them regularly, and sometimes even irregularly. They are often ushered in unexpectedly like a thief in the night, and they frequently depart as quickly. They are of value in jarring men loose from the routine and unprogressive way of doing things, but they are dangerous because they are not always genuine and frequently lead to disaster. They are a bait to the unwary, and a lure to the unbalanced. They trip up the tyro, and lay in waste ambitions of the neophyte. They mislead the enthusiastic, and disappoint the expectancy of youth. They are discouraging to those who can be discouraged, but to the real faddist there is no such word as discouragement. They are the bane of conservatives, and the glory of mal-contents. They should be accepted with caution, but they should never be wholly ignored. They are not all good, neither are they all bad. They are like fire—a good servant, but a bad master.

Sometimes it would seem as if the dental profession were more prone to faddism than any other. Dentists run aimlessly off in the direction of every rainbow of promise which casts its alluring beams before their eyes. There are many men in the profession who are apparently faddists by temperament. No sooner is one fad tried out and found wanting than they bob up serenely with another. And it matters not that they may have misled many a deserving young practitioner who has been caught by their enthusiasm and practiced the fad to his discomfiture. The faddist is perfectly cheerful over the procedure—and wholly unabashed.


The chief trouble with the faddist is that he does not test out his fad sufficiently to know whether or not it is effective before he launches it. He seizes an idea with his vivid imagination and tries it on a few cases under the vivifying spell of an apparently new discovery and the psychology of the situation makes it successful both with the faddist and the patient. After this is repeated several times the faddist proclaims to the world a new line of practice—a new fad. It runs its course, occasionally leaving something of value in its wake, but more often leaving a trail of disappointed hopes and, with conscientious men, a modicum of humiliation. There is harm in this because it tends to destroy confidence in the efficacy of dental service, and whatever does this is not for the best interests of the profession or the people.

The fad is not wholly bad but it should be cultivated with caution.

THE EDITOR'S DESK.

SEEING THE OTHER FELLOW'S POINT OF VIEW.

The most difficult thing for the average human being to do is to look with sufficient breadth at any question to see the other fellow's point of view. If this could be done there would be fewer law suits and an altogether better understanding between men. There seems to be inherent in our nature somewhere a selfishness which narrows our vision and makes us see only one side of every question under consideration—the side which most favors our own interests. If a man is perfectly honest with his fellowman as well as with himself there need be no necessity for one sidedness. Putting yourself in the other fellow's place and imagining how you would feel is wonderfully good practice, and tends to broaden the vision. It is also quite likely to develop an abounding charity which reduces friction and lends harmony to the affairs of life. What we most need in dealing with our fellowman is charity. It is the sweet savor which perfumes our acts, the cordial which quickens our sympathies, the sedative which soothes our aching nerves. It reduces the theory of living amicably with our fellows to a science, and makes life really worth the living.



Above and beyond all the petty gains of personal advantage there looms the magnificent manhood of him who would grant his fellowman the privilege of having an opinion of his own. He who would usurp to himself the right to dictate to others and direct their acts has not sufficient breadth of vision to entitle him to the prerogative of being a dictator. He is usually an unbalanced and unsafe man.

He who recognizes that there are other interests than his own, that he is only one of a great many other human beings who have been placed here to work out their destinies together, and who grants to others every privilege that he claims for himself, is a power for good in the world even though he may be only an obscure cobbler quietly working at the bench.

It would sometimes seem as if the world were all selfish and intolerant, but this is only because these attributes are apart from the natural order of things and are conspicuous because of their unnaturalness. Most men wish to do right by their fellowmen, but their vision becomes perverted and narrow through human limitations and they fail in their ideals. One of the chief factors in correct living so far as it relates to our intercourse with mankind is in being able to widen our horizon sufficiently to look on all occasions at the other fellow's point of view.

OBITUARY.

GEORGE EDWIN HUNT, M. D., D. D. S.

Born April 29th, 1864.

Died July 11th, 1914.

Dr. Hunt was in attendance at the meetings of the National Dental Association, the National Association of Dental Faculties and Delta Sigma Delta Fraternity—July 6th to 10th, 1914—in Rochester, N.Y., and took an active part in the proceedings of each society. Monday evening he presided as toastmaster, at the banquet of the Supreme Chapter of Delta Sigma Delta Fraternity and at the close of the evening's festivities, he was presented with a very handsome silver vase, appropriately inscribed, as a testimonial

of the love and esteem of his many friends and their regrets at his retiring as Editor of *Desmos*, the fraternity journal, in which capacity he had served with honor for fourteen years.

Dr. Hunt read a paper before Section II discussing the subject of Oral Hygiene on Wednesday.

Dr. Hunt reached his home in Indianapolis, Ind., on Friday and at midnight was suddenly stricken with "acute gastritis" and died a few hours later.



George Edwin Hunt, M. D., D. D. S.

Dr. Hunt was born in the city of Indianapolis, April 29th, 1864. His early education was received in the grammar and high schools of Indianapolis, followed by two years at De Pauw University and one year at the University of Michigan, engaged in studying civil engineering. For four years, 1882 to 1886, he was engaged in railroad construction work.

Entered Indiana Dental College 1888 and graduated with degree of D. D. S. in 1890, and completed course in medicine in 1892 in Medical College of Indiana. Was engaged in regular practice until 1896 with his father, Dr. P. G. C. Hunt.

A few of the positions of honor held by Dr. Hunt in his profession, are as follows: Dean and professor of Materia Medica and Therapeutics, Indiana Dental College, 1896 to 1914; President, Indiana State Dental Association, 1900-01; President, Institute of Dental Pedagogies, 1901-02; Secretary, National Association of Dental Faculties, 1905-13; Vice President, National Dental Association, 1906-07; Vice President, National Association of Dental Faculties, 1913-14; Supreme Grand Master, Delta Sigma Delta Fraternity, 1902-03; Vice President, Fourth International Dental Congress, 1904; and Editor of Oral Hygiene.

Dr. Hunt was an influential citizen and served as Secretary of the Commercial Club from 1901 to 1903; Secretary, Indiana State Board of Commerce for two years; Secretary of Board of Trustees of Indiana University and was a member of the Citizens' League, 1902. He was a Chapter Mason in the York Rite, and a Thirty-second Degree Masson in the Scottish Rite. Member of Columbia Club, Commercial Club, Board of Trade, Das Deutsches Haus and Highland Golf Club.

Dr. Hunt contributed many valuable articles to dental publications and as a writer or speaker, always managed to make the subject bright with his fund of good humor.

He leaves a multitude of friends, who sincerely mourn their loss.

In addition to his widow, he is survived by two sisters, Mrs. E. D. Kingsbury and Miss Lew Ellen Hunt and a step-daughter, Miss Frances Buchanan.

The Masonic Fraternity had charge of the funeral.

DR. ALBERT B. CLARK.

Died June 30th, 1914, at Honolulu, Hawaiian Islands in his seventieth year. His death was caused by diabetes. There are many now living in Chicago who will remember Dr. Albert B. Clark and grieve to learn of his death.

He was truly a Christian gentleman of sterling worth, and a dentist of prominence in his profession. He was born of Missionary parents, in 1845, Hilo, Hawaiian Islands. His religious and secular educations were received at that place.

Princess Liliuokalani was one of his Sunday school classmates.

He came to America at about the age of twenty-four and studied dentistry in the office of Dr. T. A. Freeman of Chicago.

He commenced the practice of dentistry in the early seventies and continued to so do until 1900 at which time he returned to his native country and continued the practice of his profession until his death.

He was an ardent churchman ever, and while in Chicago was one of the elders of the famous Third Presbyterian Church.

He married a Miss Lyman, sister of the famous Dr. Henry M. Lyman, a professor of physiology in Rush Medical College. Two daughters and one son survive him.

BOOK REVIEWS.

PRINCIPLES AND PRACTICE OF OPERATIVE DENTISTRY. By John Sayre Marshall, M. D., Sc. D., Captain United States Army, Retired. Formerly Dental Surgeon, United States Army. President, Army Examining Board for Dental Surgeons. Fourth edition; 698 pages. \$5.00 net. Published by J. B. Lippincott Co., Philadelphia and London.

In issuing a new edition of this well-known work Dr. Marshall has again placed the profession under obligation to him. The book has been carefully revised and a new chapter added on Electro-Therapeutics. The subject matter is exceedingly extensive and varied and each topic is treated in the author's characteristic terse and readable manner. Dr. Marshall has been a prolific contributor to our literature, and has always advocated sane and conservative methods. In this volume a timely warning is sounded against the indiscriminate use of analgesia—which the author claims should be called “peripheral anesthesia”—by inexperienced men who never make an examination of the patient to see if there is any danger. He fears that through this agency harm may result, and a practice which has much merit in it may be thereby brought into disrepute.

The illustrations in this book, of which there are more than seven hundred, are excellent, and the mechanical make up is a credit alike to the author and publisher.

PRACTICAL HINTS.

Edited by J. E. Schaefer, D. D. S.

(This department is for busy readers. We want short articles containing practical hints—the shorter the better. No article must exceed 200 words, unless of exceptional merit. Every dentist has some useful hint that has been of value to him, and if he will only put it in print it may be of equal value to others. That is what this department is for. Due credit will be given for every article sent. Address J. E. Schaefer, 1745 W. Harrison St., Chicago, Ill.)

Price of Platinum:—When I began the use of Platinum for continuous gum dentures it was \$6 per ounce; now \$48. In 1905 the cost of metal for a case was \$25 to \$28; now it is \$50 to \$60.—*L. P. Haskell.*

Setting Porcelain Inlays:—The setting of porcelain inlays can be facilitated after the inlay has been cemented to place, by wrapping a ligature twice around the tooth and inlay and tying the first half of a surgeon's knot.—*Dr. Reeves, Chicago.*

Difficulties in Masticating With Dentures:—The reason why it is so difficult to masticate tough meat or crusts, is because the *grinding* process is essential, and this, except in very few conditions, is impossible. The usual action of the jaw with artificial teeth is up and down, consequently the "three point-contact" is practically of little importance.—*L. P. Haskell.*

Crown for Posterior Short-Bite Cases:—In cases where the posterior teeth are broken down to the gingival border, with occlusion close, a crown may be constructed, as follows:

Prepare root and adapt band in usual manner. Open canal and fit post as for dowel crown. Notch occlusal end of post. Place post and contoured band in position. Force inlay wax into band, attaching post to wax. Carve cusps to fit occlusion. Remove wax with band and post avoiding distortion, invest in inlay flask and cast.—*C. A. Halle, D. D. S., Chicago.*

Permanent First Molars:—So often children come to us when these molars have not yet fully erupted, and we notice the enamel lobes have not properly united; there are fissures and pits, and if they are not taken care of there will be decay. The thing to do is to get them clean and dry, and work into the pits and fissures a little oxyphosphate of zinc, or better oxyphosphate of copper, and hold it down with the finger thinly coated with vaseline. By keeping the fissures closed, it will have a very material effect in keeping these teeth from decaying.—*G. W. Dittmar, D. D. S., Chicago.*

Mixing Silicate Cements:—As regards the mixing of the silicate cements, it may be said that any of them can and I believe should be mixed quickly, the necessity for a gradual incorporation of the powder into the liquid does not exist as in the oxid of zinc or copper, the point is to get into the liquid quickly as much of the powder as it will take up, bringing it to a thick putty consistency past the stage where it shows an inclination to curl up under the spatula and an agate spatula should always be used, then on to the point where it is so thick that it shows an inclination to follow the spatula on being patted but does not do so. It is then ready for insertion.—*Robt. Cruise, D. D. S., Chicago.*

Metallic Backings of Richmond Crowns:—I am safe, however, in saying that this feature of modern crown work has few advocates. Its defects are so apparent that a very short time will be necessary to discuss it. Whether the backing be of pure gold or platinum, one thing is certain, it destroys the translucency of the tooth, and materially modifies the shade of the porcelain. But in addition to these drawbacks, all will admit that no matter what method may be employed to adapt the backing to the porcelain facing, the adaptation can never be sufficiently perfect to exclude the fluids of the mouth, and a condition must of necessity exist which is far from hygienic. The removable or replaceable facings have some advantages, in that a layer of cement forms a bond of union between the backing and porcelain facing, and for a time hermetically seals the space that exists between the two, but even for this

form of facing the metallic backing is a decided objection to their use in the anterior part of the mouth.—*A. IV. Thornton, L.D.S., Montreal.*

Controlling Pain During Devitalization:—To control pain during devitalization, devitalizing paste should contain a powerful sedative such as cocain hydrochlorid or thymol. The application is protected with a disc of paper or metal and the cavity carefully sealed with cement. It is well not to leave a devitalizing preparation in teeth with undeveloped roots too long, twenty-four to forty-eight hours will usually be sufficient. It is better to remove it and to seal a dressing of dilute formocresol (about five or ten per cent formaldehyde) into the cavity, which will toughen the pulp tissue while waiting for it to die en masse. When this has taken place the pulp chamber and canals should be widely exposed so that they may be thoroughly cleansed, dried and filled. After thorough instrumentation fails, potassium sodium may be advantageously used to destroy any dead pulp tissue that is difficult of removal, the procedure being the same as described heretofore. If the hemorrhage can be controlled and the canals thoroughly cleansed they may be filled at once.—*John Stephan, D.D.S., Cleveland.*

Oxygen and Nitrous Oxid:—The use of oxygen in conjunction with nitrous oxid for producing narcosis is a delusion. It is the stumbling block that causes a great many failures. Our literature is full of the percentages of oxygen to give and I want to say, that from some experience at least I have use for no cylinder oxygen. This might not be true if we had a perfect machine. The defects in inhalers and valves have given our patients enough oxygen in most cases to do away with the necessity of cylinder oxygen turned into a bag expressly for the purpose of giving percentages. I'll grant that if you enclose your patient so that no oxygen can get to his lungs you will soon have him in a dangerous condition; but you don't so enclose him and consequently he gets atmospheric oxygen sufficient to the anesthesia demanded in short operations. If the prolonged administration be essayed you should give oxygen

either from cylinder or air in such proportions as will meet the exigencies of the case. To lay down a rule of percentages is simply assuming that there is something about patients mathematically correct and exact and undeviating, an assumption at once preposterous and ridiculous.—*C. F. B. Stowell, D. D. S., Chicago, Ill.*

The Casting Procedure:—Those using Dr. Taggart's gold inlay materials and *technique*, with a modification in heating investment, as hereinafter explained can cast 22K or lower oxidizable gold and scrap gold (writer has also cast copper with same results, as proof) and when taken from investment, washed with water and brush will be smooth, bright, sharp lines and no oxidization, similar to pure gold.

Place investment on asbestos pad over wire screen on spider of ordinary bunsen burner turning flame as low as possible and allowing it to so remain. Test with mirror held close over ring for moisture and when practically all moisture is expelled and even before or just as the investment next to ring begins to turn a darker color, which should be in 25 minutes, turn off gas. At this time wax which has been placed on outside of ring, for testing, will not be burned off.

Contrary to usual practice, we want all the wax in the investment. The gold should be heated very hot with as little heat to the investment as possible when new and suprising results will be obtained. Cast into a cold ring.—*Chas. B. Mead, D. D. S., Rockford, Illinois.*

MEMORANDA.

[Society notices will be given insertion in this department free of charge. Subsequent insertions will be charged for at the rate of \$2.00 an inch.]

NORTHERN ILLINOIS DENTAL SOCIETY.

The twenty-seventh annual meeting of the Northern Illinois Dental Society will be held in Elgin the third Wednesday and Thursday in October and promises to be a most interesting meeting. Elgin is situated in the beautiful Fox River Valley which has figured extensively in the early history of our country. Genial dentists as hosts, excellent hotel accommodations. Just convenient for the Chicago boys to catch an early train in the morning and the last train home in the evening.

Centrally located for all the other boys, no discomfort of changing cars. Cross off the dates in your appt. books now. Always something instructive at that little Northern Illinois meeting. F. H. Bowers, Secretary, Freeport, Ill.

WYOMING STATE BOARD OF DENTAL EXAMINERS.

The Wyoming State Board of Dental Examiners will meet at Cheyenne, Wyoming in the Senate Chamber on the 1st, 2nd and 3rd days of September 1914. The written examination consists of Anatomy, Physiology, Histology and Bacteriology, Chemistry and Metallurgy, Oral Surgery, Anesthetics, Operative and Prosthetic Dentistry, Materia Medica and Therapeutics, Prophylactics and Orthodontia. Applicants must present a full plaster model of upper and lower jaws with teeth, also one without teeth. Practical work will be required from all candidates taking the examination. The candidate is required to furnish his own operating instruments, dental engine, amalgam, gold, wax, and modeling compound. For further information and application blanks,, address Peter Appel, Jr., Secretary, P. O. Box 643, Cheyenne, Wyo.

RESOLUTIONS OF RESPECT FOR DR. ROSS A. PRITCHETT.

As it has pleased Omnipotence to call our worthy friend and member, Dr. Ross A. Pritchett to his reward; and remembering, among his many virtues, his great loyalty to the dental profession, and to this Society; and realizing that in his death the world, the profession, and the Madison County District Dental Society have sustained a great and irrevocable loss; therefore be it

Resolved, That we express our heartfelt sympathy to his widow and family in this their hour of great sorrow, and assure them that his memory will ever be revered and cherished by the members of the Society. And be it further

Resolved, That a copy of these resolutions be presented to his bereaved family, and one to the press; and also that a copy be spread upon the records of this Society.

J. O. RICE,
W. E. HOLLAND,
Committee.

MEETING OF THE ALUMNI ASSOCIATION OF THE DENTAL COLLEGE OF THE STATE UNIVERSITY OF IOWA.

The next meeting of the Alumni Association of the Dental College of the State University of Iowa will be held at Iowa City during the Homecoming week on Thursday, Oct. 22, Friday, Oct. 23, and Saturday morning, Oct. 24. The Iowa-Minnesota Football game will be played Saturday afternoon, Oct. 24. The entire meeting will be devoted to Prosthodontia. The officers take pleasure in announcing that they have secured the services of Dr. G. H. Wilson of Cleveland, Ohio, author of the most modern and thorough work on Dental Prosthetics, and Dr. Forrest H. Orton of St. Paul, Minn., professor of Crown and Bridge work at the Dental College of the State University of Minnesota. Dr. George H. Wilson will lecture and demonstrate on Anatomical Occlusion, its underlying principles, elucidating and comparing modern methods; also the retention of Artificial Dentures, discussing

the different principles and demonstrating the different methods. Dr. F. H. Orton will give a lecture and clinic on Crown and Bridge work. Names of other prominent Prosthodontists who will contribute to this meeting will be announced later. John Voss, Secretary.

JUVENILE ASYLUM HEAD BLAMES DEFECTIVE TEETH FOR ABNORMALITY.

Charles D. Hilles, President of the New York Juvenile Asylum, in a report of that organization, says that the abnormal boy of the type that comes to the public institutions for care needs little more than a dentist to restore him to a condition where he can make his own way in the world.

"Acting on the premise that the bad boy is generally a sick boy," says Mr. Hilles "we determined some time ago to maintain a thorough physical study of the youngsters sent to us. Sixty-five per cent. of them were anaemic, the result of poor food and irregular habits of living. To this half-starved condition could be attributed the waywardness and apparent viciousness of the boys. Their low stage of physical development had made them careless. Physically their fibre was weak; their mentality and morality suffered accordingly.

"Then we went further and sought for the physical cause of the anaemic condition of our charges. We found that more than 90 per cent. of the boys, and they were all under 15 years of age, came to us with bad teeth. For years those boys had not been able to chew their food properly. They had acquired the habit of bolting everything they put into their mouths.

"Immediately upon admission to the Children's Village the boy is sent to the dentist, who makes a searching examination of his teeth. All possible repairs are made; finally there is a thorough cleaning of the teeth. Then the boy is sent to his room armed with a toothbrush and with paste. He experiences so much relief and experiences it so quickly that almost always the boy is glad to give to his mouth and to his teeth the necessary attention. Regularly every six months each boy in the village visits the dentist. Never again so long as he is with us is he permitted to suffer because his teeth lack attention. I believe that we are right when we say the dentist is the greatest influence for good known to us. More than 90 per cent. of our boys make good and are successful after they leave us."—*The New York Times*.

PANAMA PACIFIC DENTAL CONGRESS.

The Panama Pacific Dental Congress is particularly fortunate in having secured space for its meeting in the new Auditorium in San Francisco, as this building, which will be ready for occupancy in December next, will be one of the finest auditoriums in the world, and contains every modern convenience for the use of societies and conventions. It covers an entire city block and is located in the center of San Francisco, within eight blocks of all the leading hotels, and may be reached from the Exposition Grounds in about ten minutes by either one of two direct car lines. The cars on Market Street, the main street of the city, go direct to the Auditorium. Its main hall will seat 12,000 persons; 6,000 in the balcony and 6,000 on the floor. The latter space, 198 by 200 feet, will be occupied by the exhibits of dental and pharmaceutical goods, and some of the general sessions of the Congress will be held in the balcony, the exhibit hall being closed to visitors during these sessions.



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PANAMA-PAACIFIC INTERNATIONAL EXPOSITION

The New Municipal Auditorium in the Civic Center of San Francisco.

Besides this main hall, the Auditorium contains six halls with a seating capacity of about 1,200 each, and four with a seating capacity of about 500 each. Enough of this space will be at the disposal of the Congress to accommodate the Oral Hygiene and other educational exhibits, the clinics and meetings of the various sections, and space will also be provided for the special meetings of the societies which will meet here as a part of the Dental Congress.

No Dental Congress ever held has had such good accommodations, and the fact must not be overlooked that all its sessions, clinics and exhibits will be held in one great building, easily accessible from every part of San Francisco.

RECENT PATENTS OF INTEREST TO DENTISTS.

- 1,081,307. Interchangeable artificial tooth, J. W. Ivory, Philadelphia, Pa.
- 1,081,785. Tooth powder container, W. G. Steadman, Jr., Southington, Conn.
- 1,082,365. Manufacturing artificial tooth fronts, T. Steele, Columbus, O.
- 1,082,366. Interchangeable tooth, T. Steele, Columbus, O.
- 1,082,052. Instrument for recording changes in tooth regulating appliances, R. H. Strang, Bridgeport, Conn.
- 1,082,482. Apparatus for heating nitrous oxid administering appliances, C. K. Teter, Cleveland, Ohio.
- 1,082,058. Casting artificial teeth, H. A. Wienand, Frankfort-on-the-Main, Germany.
- 1,083,893. Dental pin for artificial teeth, H. A. Edwards, London, England.
- 1,083,527. Dental forceps, B. Feldman, Perth Amboy, N. J.
- 1,083,465. Dental sterilizer, S. O. Sawyer, Traverse City, Mich.
- 1,083,766. Keying connection for dental brushes, P. N. Souzon, Philadelphia, Pa.
- 1,083,509. Dental impression tray, S. G. Supplee, New York, N. Y.
- 1,083,770. Tooth cleaning instrument, G. W. Swope, Norfolk, Va.
- 1,080,261. Automatic dental blower and syringe, I. W. Bush, North Carrollton, Miss.
- 1,085,535. Support for dental face bows, F. H. Brown, Lebanon, N. H.
- 1,085,466. Orthodontia appliance, C. F. Montag, Blue Island, Ill.
- 1,082,681. Tooth Powder, W. E. Danner, Perth, Canada.
- 1,082,630. Dental forceps, L. S. Hall, Hattiesville, Ark.
- 1,082,580. Dental broach blank making machine, J. F. Hardy, New York, N. Y.
- 1,082,776. Porcelain tooth and backing for dental bridgework, W. J. Stewart, New York, N. Y.
- 1,083,156. Manufacturing dental plates, E. Telle, New Orleans, La.
- 1,083,039. Dental engine, W. D. Wagar, Michigan, N. D.
- 1,083,163. Dental flask, L. T. Weaver, Cincinnati, Ohio.
- 1,084,537. Tooth paste container, W. J. Clark, Fort Scott, Kans.
- 1,080,017. Dental impression tray, J. Lautenburg, New York, N. Y.
- 1,080,878. Dental appliance, C. M. Ballenger, Lubbock, Tex.
- 1,080,809. Dental articulator, R. W. Burch, Ann Arbor, Mich.

Copies of these patents may be obtained for fifteen cents each, by addressing John A. Saul, Solicitor of Patents, Fendall Building, Washington, D. C.

ILLINOIS STATE DENTAL SOCIETY.

Officers and Standing Committees—Officers 1914-15—President, J. M. Barcus, Carlinville; Vice-President, J. P. Buckley, Chicago; Secretary, Henry L. Whipple, Quincy; Treasurer, T. P. Donelan, Springfield; Librarian, John D. Wilson, Danville.

Executive Council, 1914-15—Ex Officio—J. M. Barcus, Carlinville; Henry L. Whipple, Quincy; T. P. Donelan, Springfield. Terms Expire 1915—A. D. Black, Chicago; J. P. Buckley, Chicago; G. C. McCann, Danville. Terms Expire 1916—L. E. Coonrad, Decatur; J. F. Leigh, Chicago; J. K. Conroy, Belleville. Terms Expire 1917—J. P. Luthringer, Peoria; C. B. Warner, Urbana; T. L. Grisamore, Chicago.

Ad Interim Committee of Executive Council—J. P. Buckley, Chairman, Chicago; G. C. McCann, Danville; L. E. Coonrad, Decatur.

Program Committee—L. B. Torrence, Chester.

Clinic Committee—W. F. Whalen, Peoria, Chairman; T. A. Broadbent, 15 E. Washington, Chicago.

Local Committee on Arrangements—J. R. Welch, Chairman, Peoria; L. R. Snowden, Peoria; W. J. Weatherwax, Peoria.

Committee on Exhibits—R. H. Daniels, Chairman, Peoria; P. B. D. Idler, Chicago; F. D. Parker, Peoria.

Committee on Dental Science and Literature—G. C. Poundstone, 2605 Milwaukee Ave., Chicago.

Committee on Dental Art and Invention—G. E. Meyer, 4216 Irving Park Blvd., Chicago.

Committee on Publication—Henry L. Whipple, Quincy; Edmund Noyes, Chicago; F. E. Ebert, Champaign.

Committee on Transactions—Edmund Noyes, Chicago.

Committee on Infraction of Code of Ethics—D. S. Anderson, Decatur; C. E. Duff, Lawrenceville; Lester Bryant, Chicago.

Board of Censors—H. G. Trent, Rock Island; C. E. Sowle, Rockford; W. O. Fellman, Oak Park.

Committee on Necrology—J. G. Reid, Mallery Bldg., Chicago; N. D. Vedder, Carrollton; J. B. McMillan, Macomb.

Public Service Commission—Harry F. Lotz, Chairman, Joliet; Geo. N. West, Chicago; P. A. Pyper, Pontiac; G. F. Corley, Mattoon; W. A. McKee, Benton.

Committee to Promote Closer Relations and Co-operation with the Illinois Medical Society—C. P. Pryun, Chicago; C. L. Snyder, Freeport; A. C. Willman, Kankakee.

Committee on Legislation, and Appointment of Members of State Board of Dental Examiners—C. R. E. Koch, Chicago; T. W. Brophy, Chicago; G. W. Dittmar, Chicago; J. E. Keefe, Chicago; T. P. Donelan, Springfield.

DENTAL COLLEGE COMMENCEMENTS.

UNIVERSITY OF BUFFALO, DENTAL DEPARTMENT

Graduates—J. L. Bailey, H. L. Barclay, L. MacL. Bartlett, W. C. Bates, L. A. Bennett, H. U. Berger, G. H. Brasted, W. D. Burt, W. H. Card, P. V. Clay, J. L. Cleveland, A. D. Conforto, A. J. Corrigan, C. P. Dillon, F. W. Earl, F. X. Fromholzer, H. V. Gerstman, J. H. Gilliat, F. M. Gillick, C. F. Hale, B. M. Harris, F. J. Hofschneider, C. M. Hollway, A. P. Horton, H. S. Horton, L. C. Howes, E. F. Jung, L. E. Kay, E. J. Knoche, L. J. G. Lindgren, G. W. Lorenz, E. R. Maguire, M. H. McOmber, F. DeS. O'Brien, K. W. Phillips, E. O. Ploss, W. C. Richardson, D. Rosenblatt, G. D. Ross, G. O. Rozan, E. J. C. Smith, C. S. Southwick, I. G. Speidel, H. E. Tompkins, J. E. Walsh, R. H. Wickins.

UNIVERSITY OF MICHIGAN, COLLEGE OF DENTAL SURGERY.

Graduates—L. E. Baribeau, F. Benham, L. G. Beshgetoor, D. J. Bort, C. H. Brady, D. C. Broadbridge, J. A. Calby, B. E. Champe, F. C. Daniels, M. L. Davis, A. F. De Heer, R. P. Dendel, A. H. Dredge, J. Drozkowski, Jr., A. F. Eidemiller, A. W. Farley, R. C. Field, E. J. Green, J. M. Gregory, W. E. Guerrier, E. S. Hanna, E. V. Harrington, P. C. Hohl, F. McL. Holmes, F. R. Jackson, T. P. Jamison, B. D. Jones, C. McC. Jones, F. A. Klopfer, N. D. Kulasavicz, R. E. Lambert, R. Lown, F. P. McCarthy, O. Manthey, C. V. Manville, P. E. Meyer, R. C. Morrison, J. A. Motley, F. J. Mulcahy, F. E. Nichols, P. H. O'Leary, C. L. Pickell, H. Pilgrim, E. L. Pilkington, L. E. Read, C. A. Rice, M. E. Rice, D. F. Roedel, E. C. Ryle, E. B. Schlencker, C. C. Schwartzbek, J. A. Scofield, J. G. Shaffer, M. M. Sheaffer, E. R. Smith, B. E. Stevens, J. R. Teifer, C. N. Vyn, C. U. Walker, B. D. Welling, L. A. Weston, G. E. Wittet.

NORTHWESTERN UNIVERSITY DENTAL SCHOOL.

Graduates—C. A. Alcorn, R. A. Anderson, V. Anderson, R. A. Armour, G. M. Babbitt, G. C. Barkley, R. E. Bechtel, E. C. Bernhisel, J. M. Bernhisel, Jr., R. E. Blackwell, R. O. Brandt, E. M. Buchner, H. C. Buttery, J. J. Bybee, R. M. Chappell, P. D. Chisolm, E. W. Chrisman, T. S. Christensen, P. W. Clopper, A. E. Colletti, J. J. Collins, L. J. J. Cools, J. J. Corlew, M. J. Couch, M. Cruse, P. V. Crosthwait, V. E. Cultra, D. E. Curry, F. C. Dallimore, F. B. Daugherty, M. P. Daunhauer, O. B. Day, J. V. D. De Boer, J. H. Dickey, E. R. Doering, W. F. Dravel, T. Dybing, W. R. Eberle, J. Ellsworth, R. A. Evans, C. D. Ewing, C. O. Fillinger, W. F. Foss, J. E. Frankel, C. L. Fraser, H. L. Freeland, E. D. Fritsch, I. Funkhouser, J. C. Gallagher, L. W. Gange, C. A. T. Gasslander, H. T. Green, Jr., R. J. Hamilton, H. G. Hanson, W. C. Harper, R. B. Harphani, J. E. Harris, A. Haugen, M. E. Helm, A. C. Hemsworth, H. D. Hipsh, F. J. Hirn, H. F. Hollister, W. G. Hopper, R. W. Horlick, W. W. Horn, C. M. Hurley, A. E. Hurt, J. J. Ingle, Jr., C. G. Irons, C. P. Jackson, W. F. Jamison, A. Jaster, H. B. Jensen, R. H. Jirka, H. E. Johnson, M. O. Juel, L. H. Jung, C. Kato, S. Kato, J. B. Kennedy, N. L. Kettlewell, B. H. King, A. H. Knaak, A. H. Kratky, L. W. Kremer, G. L. Kroshus, N. E. Kuehn, A. J. La Grow, L. I. Lane, H. W. Latham, M. L. Lehmann, W. J. Lewis, J. P. Lipsky, E. Lomholt, M. B. Loomis, A. E. McKnight, Jr., J. C.

Martin, H. D. Menges, B. S. Merwin, E. S. Metcalfe, A. L. Miller, J. H. Mitchell, C. E. Mortensen, L. B. Mughalian, M. W. Murray, A. H. Nolan, G. R. Oden, C. J. Olson, H. J. Ordon, H. W. Page, G. F. Pan-konin, R. P. Parcels, L. W. Park, T. P. Pett, T. W. Prail, V. B. Rea, W. D. Reeve, W. J. Rennie, J. E. Ridgway, G. A. Rivard, C. G. Rorer, R. S. Rose, J. S. Ross, R. M. Russell, E. Satek, W. H. Saeger, Jr., E. A. Schniedwind, R. A. Sears, R. B. Slack, H. A. Smith, O. C. Soellner, E. Soucek, C. J. Stanton, C. T. Steffy, V. F. Stephens, L. E. Steward, F. B. Stubbert, E. F. Sullivan, L. A. Templeton, C. R. Terry, G. M. Terry, N. G. Thomas J. R. Thometz, S. Vinje, H. B. Weiler, O. K. Westling, T. White, A. T. Williams, L. A. Wills, R. M. Wilson, W. H. Wodrich, E. F. Wollin, G. W. Young, C. F. Zak, L. H. Ziegler, L. A. Ziemke, J. A. Zwisler. (Total, 158.)



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A HISTORICAL SKETCH OF THE FIRST THIRTY YEARS OF THE ILLINOIS STATE DENTAL SOCIETY, 1865 TO 1893 INCLUSIVE.†

BY EDMUND NOYES, D. D. S., CHICAGO.

It is not "the short and simple annals of the poor" to which we invite your attention this evening. There were great and kingly men in those days; great in their knowledge, skill and experience; greater still in the unselfish devotion with which they served their profession and humanity in the State Dental Society they loved so well.

*"In pursuance of a call signed by a committee of three on behalf of the Chicago Dental Society, together with several dentists of the State of Illinois, about fifty dentists assembled at the Dental Depot of S. S. White, Esq., in the City of Chicago, on the evening of July 24th, 1865, for the purpose of organizing a State Dental Society.

"Dr. A. C. Van Sant, of Princeton, was chosen temporary chairman, and E. Honsinger, of Chicago, temporary secretary."

The officers elected at this meeting for the ensuing year were A. C. Van Sant, president; E. Honsinger, vice-president, and Edgar Park, secretary. Drs. E. A. Bogue, C. B. Rising, and T. P. Abell, were appointed a committee to "adapt the constitution of the Massachusetts Dental Association to the wants of the Illinois State Dental Society." A constitution was reported by this committee and, after being amended, was adopted and

†Read at the fiftieth anniversary of the Illinois State Dental Society, Chicago, March 23, 1914.

*From the minutes of the first meeting as published by the Society in a supplement to the Transactions for 1876.

signed by forty-nine charter members. There is no man now living who has retained his membership continuously since the organization. Those who did so till death were Drs. Geo. H. Cushing, A. W. Freeman, E. Honsinger, M. S. Dean and J. N. Crouse of Chicago; C. A. Kitchen, Rockford; H. N. Lewis, Quincy, and W. W. Ormsbee, Geneva. J. N. Crouse, who was the last survivor of them, died in January, 1914. Drs. A. C. Van Sant, A. E. Brown and L. P. Haskell are still alive and there may be a few others unknown to the writer.

The first meeting appears to have been limited to an evening session, July 24th, and a morning session, July 25th. Besides the adoption of a constitution, the election of officers, and the appointment of delegates to the American Dental Association, the Society listened to an address by Dr. I. J. Wetherbee, of Boston, "soliciting their aid to the Boston Dental Protective Union in their suit endeavoring to have nullified letters patent, granted to one Dr. Cummings, as the inventor of vulcanized rubber as a base upon which to mount artificial teeth."

The second annual meeting was held in the Tremont House parlors May 8th, 1866. Dr. Van Sant, the president of the previous year, was absent and the Society was called to order by the vice-president, Dr. E. Honsinger of Chicago. By-Laws were adopted, and Drs. W. W. Allport and J. P. Foltz of Chicago, and E. C. Stone of Galesburg were elected to membership. The latter remained a member till his death. The officers were elected on the first day of the meeting, and this was the custom for several years. The officers of this second annual meeting were H. N. Lewis of Quincy, president; O. Willson of Aurora, vice-president, and Gilman T. Smith of Princeton, secretary. I received last September, and have now turned over to the secretary, the original minutes of this meeting written by Dr. Smith.

No essays were prepared beforehand and on the first afternoon a committee reported eight subjects for discussion, as follows: "Eruption of the Deciduous Teeth," "Treatment of Decay in Deciduous Teeth," "Under What Circumstances Should Deciduous Teeth Be Extracted to Avoid an Improper Arrangement of the Permanent Teeth?" "What Preparation of Gold is Best for Filling Teeth?" "Treatment of Exposed Pulps and Filling Pulp

Cavities," "Treatment of Diseased Gums and Alveolar Processes;" and "Mechanical Dentistry." The discussion of these topics appears to have occupied most of the time of the three days' meeting, except the evening of the second day, in which a clinic was given in Dr. Sherwood's office showing the extraction of teeth with nitrous oxide anaesthesia. At this meeting Dr. M. S. Dean was invited to deliver an address at the next meeting, which was held in Chicago in November of the same year, the first plan of the Society being to hold meetings semi-annually. At this November meeting Dr. M. S. Dean read the address he had been requested to prepare and received a vote of thanks by the Society. Dr. Cushing also read an essay on "Causes and Prevention of Diseases of the Teeth."

It is noticeable that at this third meeting, the second at which any professional subjects were discussed, Dr. Dean and Dr. Cushing were the ones who came with essays written beforehand, and the useful and influential part which they began to take thus early they each maintained with increasing honor and success to the end of their lives. At this meeting the code of ethics of the American Dental Association, with slight modifications, was adopted.

The third annual meeting was held in the Methodist Church block, Chicago, May, 1867. The officers were elected on the morning of the first day. Dr. Geo. H. Cushing, president; Dr. M. S. Dean, secretary. The By-Laws were amended to make the meetings annual instead of semi-annual. Dr. E. D. Swain and Dr. C. R. E. Koch were elected to membership. Dr. Swain continued his membership till his death. Dr. Koch till the present time, and is now the oldest man in uninterrupted membership.

At this meeting clinics were held on the morning of each day except the first.

Essays were read at this meeting by Dr. O. Willson on "Anaesthesia," and Dr. L. P. Haskell on "Continuous Gum." A number of other subjects were discussed, and a committee was appointed to secure essayists who should open the topics for discussion at the next regular meeting. At this early time in its history the Society adopted the policy, continued till the pres-

ent time, of having the discussion of professional subjects introduced by formal papers prepared beforehand.

At this meeting Drs. Homer Judd, Isaiah Forbes, W. H. Eames and Edgar Park of St. Louis, were made honorary members. These were the first of a splendid company of St. Louis men, who, for many years, were active members of our Society for all purposes except voting. They were always most heartily welcome and contributed largely to the interest and value of our proceedings. Dr. Kennicott offered the following resolution, which was adopted: "Resolved, That this Society unqualifiedly condemns the practice by members of the dental profession, of taking students, to be sent forth to practice upon a confiding community, after only from three months to a year's study, for a pecuniary consideration; and would recommend that students be taken for a term of not less than three years of study, in addition to graduation." For that time this was a rather remarkable resolution. It serves to show, on the one hand, with what meager preparation some men attempted to practice dentistry, and on the other hand what high standards of professional character and education the Illinois State Dental Society set before its members.

In 1868 the Society forsook Chicago and began its itinerary among the cities of the state, holding the meeting of that year in Springfield. Among the new members at this meeting were Drs. G. V. Black and Chas. Henry of Jacksonville, and C. Stoddard Smith of Springfield. Dr. H. J. McKellops of St. Louis was elected an honorary member. Dr. Henry continued in membership until his death. Eight essays were read at this meeting, of which Dr. Cushing read two and Dr. Dean one.

Drs. Kilbourne, Black and Cushing were appointed to prepare an address to the people on the importance of the proper treatment of the sixth year molars.

The meeting of 1869 in Quincy was very noteworthy in several particulars. For the first time arrangements were made for the publication in full of the papers and discussions, which was done for that year in the July number of the Missouri Dental Journal.

At this meeting Dr. G. V. Black read a paper on "The Preparation of Gold Foil for Filling Teeth." This appears to have been the first contribution by a member of our Society of something *new* to the fund of knowledge of the dental profession. He described a great number of experiments he had conducted and announced the scientific explanation for the cohesiveness or non-cohesiveness of gold foil in these words: "The welding of pure gold is prevented by the gases being condensed on its surface, thereby preventing intimate contact; the direct effect of annealing is to drive off such gases, and render the surfaces clean." I believe that all previous explanations of the cohesiveness and non-cohesiveness of gold foil, or, as was often said in those days, the adhesiveness or softness, had been little if anything better than guesses. This paper by Dr. Black is the final authority on the subject, and, so far as I know, nothing of importance has been added to it since.

At this meeting, the officers were elected on the first day of the meeting, as had been done at all previous meetings, but "Dr. Black proposed to amend the by-laws so that hereafter the election of officers shall take place at the close instead of the beginning of the session. This, under the rules, had to lie over for one year." It was adopted at the next annual meeting and resulted in Dr. M. S. Dean being president at two annual meetings, though only once elected.

The committee appointed the year previous (Drs. Kilbourne, Black and Cushing) to prepare an address to parents on the sixth year molars, to be published as far as practicable, in all the public journals throughout the state, reported what they had prepared for that purpose. It was received and referred to a select committee of three, Drs. Kilbourne, Rivers and Black. This purpose of general publication was not carried out, but it was the first attempt of the Society as an organized body to instruct the general public upon dental matters.

Among the new members at this meeting were Drs. S. M. Sturgiss of Quincy, K. B. Davis of Petersburg, and A. E. Matteson of Kewanee. The last named is still with us; the others retained their membership till death. Drs. J. B. Morrison, A. W.

Morrison, and H. S. Chase of St. Louis, and J. H. A. Brewer of Palmyra, Mo., were made honorary members.

The meeting of 1870, at Bloomington, was notable for two things. First, the publication and distribution of the proceedings in a volume issued by the Society; and it is interesting to notice the lavish way in which they were scattered. The publication committee in their report say, "750 copies of the Transactions have been distributed as follows: 1st, a sufficient number were sent to the meeting of the American Dental Association, at Nashville, in August last; 2nd, to all the active and honorary members of this Society; 3rd, to all members of the profession throughout the state, so far as the names could be ascertained by the lists of the Rubber Company, and lastly to such other members of the profession in the vicinity of this state and elsewhere as occurred to the committee. A limited number have also been sold; some to advertisers, who distributed them, and others to other parties for distribution."

The other notable event of this year was the reading of two papers on dental legislation, by Geo. H. Cushing and G. V. Black, and a very thorough discussion of the subject, resulting in the appointment of Drs. Cushing, C. S. Smith and A. W. French, a committee to prepare a bill and present it to the legislature and urge its passage. Thus was begun the long legislative campaign which was continued vigorously and without intermission for eleven years, till the passage of the first dental law of Illinois in 1881.

At this meeting, 1870, Dr. Dean referred to the introduction during the preceding year of the "Pneumatic engine," invented by Mr. Green, of Kalamazoo, Mich. This was the first of the dental engines.

Rubber dam made its first appearance in our Society proceedings in a contribution to the S. C. Barnum testimonial fund of \$120.00 contributed by the members and \$25.00 additional from the Society treasury. Dr. Cushing at this meeting described and advocated the use of heavy foils for filling teeth. Nos. from 12, 20 to 120, but chiefly 30, 0 and 60.

At the meeting of 1871, at Peoria, Dr. H. H. Townsend of Pontiac and G. B. Salter of Joliet, became members, both of

whom continued in membership till death; also Dr. W. T. Magill of Rock Island, who survives, a life-member, living in California. He is 82 years old.

Drs. W. O. Kulp of Muscatine, Wm. N. Morrison of St. Louis and Isaac George of Kenosha, Wis., were elected honorary members.

At this meeting Bonwill's electro-magnetic mallet was exhibited, and two dental engines, one by Dr. Edwards of Peoria, and one by Dr. Black, of Jacksonville.

Dr. M. S. Dean read a notable paper on ethics, from which I will quote one paragraph: "The leading men in our profession—that is, the more educated and skillful—are members of one or more dental societies. * * * They are the men who raised the profession from its low origin to its present rank and influence—the men who created the profession. Take from it those who habitually attend these societies and you destroy entirely the *professional* character of our vocation and reduce it to the commonest of trades. Amalgam and rubber would gain the ascendancy and the forceps would hold undisputed sway. By this I do not mean to be understood that every individual who attends dental societies is a prodigy of learning, skill and morality, but I do mean that whatever of learning, skill and morality there is in the profession are found in dental societies. When you find a dentist of even common education and moderate skill who is not a member of a dental society, you will find tropical fruits growing spontaneously in Alaska and the polar bear dancing on the equator. These societies contain all that is worthy of repute in our profession—all who have assisted in establishing the credit of dentistry against the assaults to which the profession has been and is constantly subjected by unqualified and dishonest practitioners."

This meeting in 1871 appears to have been an unusually good one. There were ten papers and nearly all of them of excellent merit. It is difficult for most of us at the present time to realize fully the important service which the Society gave to its members in those days. It must be remembered that only a small fraction of the number practicing dentistry had ever been in a dental college, but had come into the profession through a

longer or shorter pupilage in some private office, often with a very meager study of text-books. It happened, therefore, that the meetings of the Society were a four days school of dentistry and many of the papers read, upon such subjects as filling teeth, capping exposed pulps, destroying pulps and filling roots, alveolar abscess, diseases of the antrum, and many others, were fairly exhaustive treatises, and showed indications that the writers had probably looked through about all the readily available literature of the dental and medical professions upon the subjects about which they were writing.

When, therefore, men used to stand up in the Society and say that whatever of professional knowledge and skill they had acquired they owed the most of it to the Illinois State Dental Society, there was more in it of sober fact than of "hot air."

The meeting of 1872 was held in Chicago, and Drs. J. W. Davis of Mason City, A. W. Harlan of Chicago, C. E. Matteson of Macomb, J. F. Marriner of Ottawa, M. F. Hand of Joliet, D. B. Freeman of Chicago, who continued in membership till death, and T. L. Gilmer of Waverly, I. A. Freeman and E. Noyes of Chicago were elected to membership, also Dr. J. F. Thompson of Chicago, a charter member, who had allowed his membership to lapse. Drs. C. C. Chittenden of Madison, Wisconsin, and R. S. Rathbun of Lyons, Iowa, were made honorary members.

At the meeting in 1873, at Rock Island, the amendment to the by-laws proposed the year previous by Dr. Kennicott, was adopted, as follows: "Section 1, Article 5, 'Duties and privileges of members.' Section 1. An active member shall not accept a student for a less period than three years, and shall require each student to give a written obligation to graduate at some regularly organized dental college, before he assumes the responsibilities of a dental practitioner." It will be noticed that this requirement, now made law binding upon the members, is of similar purport to the advisory resolution offered by Dr. Kennicott and adopted in 1867, six years previously.

— Drs. R. H. Antes of Geneseo, who continued in membership until his death, and E. B. David of New Windsor, were elected to membership, and Dr. L. C. Ingersoll of Keokuk, Iowa, was

made an honorary member. This was a joint session with the Iowa Society.

At the meeting in 1874, in Jacksonville, Drs. C. B. Rohland of Alton, who remained with us till death, and J. C. Widenham of Jacksonville, who is still with us, were elected to membership, and Drs. J. Taft and C. R. Butler of Ohio, and C. W. Rivers of Missouri, were made honorary members.

Dr. J. Frank Merrimer read a paper on "Popular Education with Regard to the Subject of Dentistry." This was followed by the appointment of M. S. Dean, K. B. Davis and C. Stoddard Smith, a committee for the purpose of devising the best means for the education of the public, to report at the next annual meeting. This committee announced the following year that they were unable to agree upon a report.

At the meeting in 1875 in Ottawa, Dr. J. Campbell of Bloomington, was elected to membership. He is still with us. Dr. E. J. Perry of Sycamore, elected at the same meeting, was for many years in Chicago, and is now retired from practice.

In 1876, at Galesburg, the new members who continued in membership were Drs. C. P. Pruyn, T. W. Brophy, A. B. Clark, of Chicago, who are life members, and W. A. Stevens of Chicago, who was a member till his death, as was also J. W. Fisher of Bloomington.

At this meeting arrangements were made for a stricter examination of candidates for membership, with the intention that thereafter none should be admitted who were not reasonably competent and well educated in their profession. A board of three censors was provided for, who were instructed to prepare lists of questions, twenty each, and candidates were to be required to pass at least 75 per cent. Diplomas from good schools were accepted without examinations, and this policy was continued till all the candidates came with diplomas and examinations were no longer necessary.

The committee on secretary's report recommended that the records of the Society not previously printed in the published transactions, be printed as an appendix to the next annual volume. This was done from the organization of the society to and including the year 1869.

At the meeting of 1877 in Springfield, Drs. E. Duncan of Jacksonville, F. H. Gardiner of Chicago, and A. S. Waltz of Decatur, were elected to membership, all of whom are living, and life members. Dr. T. W. Pritchett of Whitehall, who has recently died much lamented, was also elected at this meeting.

The committee on popular education, Dr. M. S. Dean, chairman, reported a pamphlet for popular distribution, nine thousand copies of which were ordered by the members present. This was entitled "Our Teeth" and was published in the name of the Society. The treasurer was instructed to purchase as many copies of "Dr. Judd's Anatomical Description of the Permanent Teeth," as necessary to supply each member of the Society with a copy. This was probably the best anatomy of the permanent teeth until the publication of Dr. Black's "Dental Anatomy" many years later.

At the meeting of 1878 in Rockford, Drs. Jas. W. Cormany of Mt. Carroll, and M. L. Hanaford of Rockford, joined the Society, both living life members.

Two notable papers at this meeting were the one by Dr. Black on "Neuralgia," and one by Dr. M. S. Dean on "The Epithelia and Some of Their Derivatives, Especially the Dental Germ." Dr. Dean had made an exhaustive study of the authorities on tooth development and presented the subject so clearly by the help of drawings made by himself, as to be well understood by those who heard him. Afterward Dr. Dean published a translation of the work of Legros and Magitot on this subject, with some additions of his own.

At the meeting in Springfield in 1879 the new members were Drs. R. N. Lawrence of Lincoln, now a life member, and D. B. Baker of Quincy, who retained membership till his death.

Dr. M. S. Dean gave an address on "The Development of the Embryo Jaws." This was a continuation, or another portion of the subject presented by him the previous year.

At the meeting in 1880 in Bloomington the new members were Dr. Garrett Newkirk of Wenona, for many years in Chicago, now living in Pasadena, California, W. H. Taggart of Freeport, and G. D. Sitherwood of Bloomington, life members, and C. R. Taylor of Streator, with us till his death.

Several notable papers were read. One by Dr. Newkirk on "Nervous Reflex Action;" one by Dr. Koch, on "Treatment of Teeth with Dead Pulps and Alveolar Abscess." Following the latter paper, Dr. Black presented twenty-six illustrations of the various forms of alveolar abscess and abscesses of the face and mouth, painted on a black background, in water colors and India ink. Papers were read by Dr. Brophy on "Carbolic Acid and Creosote;" by Dr. Black on "Some Points in the Natural History of Caries, and the Value of Fillings for its Arrest;" and by Dr. Harlan on "Saliva; Its Characteristics in Health and Disease;" and these were not all. It is, of course, impossible to mention many of the papers read at the various meetings. I have mentioned these of that one meeting that you may have some idea what sort of meat we were fed upon in those days.

At the meeting in Rock Island in 1881 Drs. S. F. Duncan of Wilmington, W. C. Martin of Peoria, and Thos. G. Wonderly of Galena were elected to membership. These are life members. Dr. John J. R. Patrick, deceased, was also elected at this meeting.

Drs. W. C. Barrett, Buffalo, N. Y.; Geo. A. Bronson, St. Louis, Mo.; J. G. Templeton and D. Gale French of Pittsburgh, Penna., and D. C. Hawkhurst, Battle Creek, Mich., were made corresponding members.

One of the most important papers at this meeting was by Dr. T. L. Gilmer on "Fractures of the Inferior Maxilla," illustrated by forty water color drawings by Dr. G. V. Black, showing the muscles of mastication, many varieties of fractures, and splints for them, and the method of bandaging. These illustrations were published in the Transactions, and with the paper made a very thorough exposition of the subject. Another paper worthy of special mention was by Dr. E. S. Talbot on "The Chemistry and Physiological Action of Mercury as Used in Amalgam Fillings." It was an account of numerous experiments carried on to establish the fact that mercurial vapor is given off from amalgam, and to prove its injurious effects upon vegetable and animal life. Such experimental work as described in this paper is always to be encouraged, whether it be successful and conclusive or not. It must be admitted that this paper had very little influence to restrain the use of amalgam by the profession.

At this meeting, the legislative committee reported that the dental bill had been introduced in both houses of the legislature, had been defeated in the House, but had passed in the Senate, and told of the efforts to influence the House members who had voted against it through the dentists practicing in their districts, and that promises enough had been obtained (if they should be kept) to pass the bill if it could be again brought up in the House. They also acknowledged the help received from the Chicago Society by an appropriation of money and by the efforts of their committee, Drs. Harlan, Brophy and Talbot. The bill was passed soon after the meeting and became effective July 1st of that year, 1881.

The meeting in 1882 was held at Quincy. Dr. Wm. N. Morrison of St. Louis read a paper on "Metallic Crowns," in which he quoted from the Missouri Dental Journal of 1869, p. 184, fourteen years previous, a description of a gold shell crown made by him and set with oxychloride of zinc, upon the root of a lower first molar.

Dr. Brophy read a paper on "Caries and Necrosis of the Maxillary Bones," and Dr. Black one on "Phagedena Pericementi," a term proposed by himself. In this paper he also gave two of his "1-2-3" formulas. A very interesting paper which attracted much attention was read by Dr. John J. R. Patrick on "High Civilization Not the Cause of Tooth Decay." Dr. Patrick greatly desired to have the skulls in all large anatomical museums examined, and tried to get the Society interested in it. A committee was appointed and some money appropriated. This committee was continued from year to year until 1887. They finally reported that they had been unable to accomplish anything and were discharged. They were afterwards reappointed, and some money was raised, which was finally paid over to a committee of the American Dental Association engaged in the same work.

Just before this meeting Dr. W. A. Stevens of Chicago wrote to a member of the local committee asking him to engage a riding horse for him, as he wished for some exercise on horseback while in Quincy. When Dr. Stevens went up to the room reserved for him at the hotel, he found an elegant saddle, bridle,

riding whip and spurs mounted on a saw-horse. Seven years afterwards, at the quarter-centennial meeting, in Quincy, at the banquet, after eating, President Cushing called the meeting to order and said: "Ladies and gentlemen: The first toast on the program this evening, 'What I know about Saddle Horses in Quincy,' will be responded to by Dr. W. A. Stevens of Chicago."

At the meeting of 1883 in Decatur, Dr. Ottofy read a paper in which he gave the results of the examination of 355 school children in Grand Forks, Dakota. He found thirty (equal to $8\frac{1}{2}\%$) with complete and perfect sets of teeth. This was long before the present general movement for the examination of school children, and was inspired by the paper of Dr. Patrick at a previous meeting.

Dr. Brophy read a paper on dental education from which I will quote one paragraph, referring to the "Chicago Dental Infirmary," which had then just about completed its first course of lectures: "Firm in the belief that a medical education is as essential to the dentist as it is to other medical specialists, the opinion of some of our honored and respected contemporaries to the contrary notwithstanding, the profession in Chicago, as most of you are aware, have organized a dental infirmary, in which medically educated men are prepared to enter upon the practice of dentistry." At that time the medical schools required two courses of four or five months each, and the infirmary courses were arranged to follow the medical, so that a student might acquire both medical and dental degrees in two years, or three at the most; but that was too much for the students of that day, and after giving two courses of lectures and graduating two students and giving one honorary degree, the Chicago Dental Infirmary became the Chicago College of Dental Surgery.

At this meeting the members presented a gold-headed cane suitably inscribed, to Dr. G. V. Black, and the presentation speech was made by Mr. S. R. Bingham, of blessed memory, the Chicago manager for the S. S. White Co.

At the meeting of 1884 in Springfield the president, in his address, suggested that "It would be a useful service if some one would carefully watch the entire periodical literature of the profession through the year and bring to the next meeting a

concise statement of everything that had been brought out, with, as far as might be possible, a critical estimate of its merits. It might be worth while to consider whether work of this kind could not be most satisfactorily accomplished by a number of standing committees." Drs. Black, Cushing and Kitchen were appointed a committee on the president's address, who afterwards reported recommending a committee of three on dental science and literature, and a committee of three on dental art and invention. This recommendation was carried out and from that time till the present the reports of these two committees have been a useful part of our proceedings at each meeting. It was soon found, however, that the chairman of each committee did all the work, and the other two members were eliminated.

Dr. W. H. Eames of St. Louis, read a paper on "The Origin of Defective Enamel," a sequel to one he read the previous year.

Dr. W. X. Sudduth read one on "Dento-Embryonal Histology." Dr. Sudduth had read papers on histology at several previous meetings successively.

This was the twentieth annual meeting and Dr. Koch read a paper entitled: "Illinois State Dental Society—What Has It Accomplished?" This was a concise and very entertaining history of the Society to that time. If the present writer had simply copied it, he would have saved himself some trouble and you would have been better entertained.

At the meeting 1885 in Peoria, Dr. Harlan read "Notes on New Remedies," which was a continuation of former presentations. He enumerated many, but discussed in detail only resorcin and cocaine. This was less than a year after the discovery of the anaesthetic properties of cocaine. He says, "The two and four per cent solutions of the hydrochlorate applied to an exposed pulp (not inflamed), will produce anaesthesia in from eight to fifteen minutes. The same solutions applied for thirty minutes or longer to an inflamed or congested pulp produced no effect whatever. Aqueous solutions painted on the gums before the adjustment of the rubber dam or the application of a clamp are uniformly successful." Other uses and other forms of the drug were mentioned.

At this meeting Drs. Black, Marshall and Koch were made a committee "To devise means of so disposing of the routine business of this Society that there shall be more time left which can be devoted to the scientific work."

The meeting of 1886 in Rock Island had several special features. Drs. Cushing, Koch and Noyes were appointed a committee to revise the constitution and by-laws and publish the revision so that it could be acted upon at the next meeting. This was carefully done and the revision reported was adopted in 1887.

Drs. Cushing, Swain and Marriner were appointed a committee on local societies, and reported at the same meeting, recommending the formation of six local societies and the appointment of a committee of seven to arrange for their organization. Dr. Koch, at large, Dr. Kitchen, for Rockford district, Dr. Sitherwood for Bloomington district, Dr. Tibbetts for Quincy district, Dr. Rohland for Centralia district, Dr. Dwight for Danville district, and Dr. J. A. W. Davis for Galesburg district. Dr. Koch was most active and influential in carrying out this plan and four societies were formed, the Central Society being already organized. There were afterwards some consolidations and one was discontinued, but generally these district societies continued in active usefulness till the reorganization of the State Society and the formation of component societies in 1904, when all of them except the Northern were absorbed by the component societies. The Northern Illinois Society still maintains its life and usefulness. It cannot be doubted that experience in these district societies made the component societies of the later time more easily successful.

The special features of this meeting were Dr. Black's cultures of micro-organisms of the mouth, and Dr. Harlan's paper on antiseptics and disinfectants, and the discussion. Dr. Black set up his incubator and started cultures the first day and showed the progress of growth and explained the characteristics of the organisms each day of the meeting.

At the meeting in 1887 in Jacksonville a paper was read by Dr. Judd on "Dead Teeth in the Jaws." This and one read at the meeting in 1886 were inspired by some articles in the Medical Record in which the editor and Dr. Sexton, an eye and ear

specialist in New York City, had undertaken to school the dental profession on this subject, suggesting, among other things, that physicians might find it necessary to instruct dentists to remove all pulpless teeth from the jaws. The dentists were considerably stirred up about it and a good deal of just resentment was expressed. Such a thing could hardly happen at the present time, for there has come to be a general understanding that in its own field the dental profession is more competent than the medical. However, some of our careless operators have come dangerously near to giving members of the medical profession excuse for taking a similar attitude in respect to crowns and bridges.

For a number of years in succession about this time, Dr. Black continued his lectures on the micro-organisms of the mouth and Dr. Harlan his papers on practical therapeutics and the use of special remedies, particularly the newer ones.

At the meeting of 1888 at Cairo, in accordance with the suggestion of President Rohland, Drs. E. Noyes, G. H. Cushing and E. D. Swain were appointed a committee to revise and republish the pamphlet "Our Teeth." This was done and a thousand copies were printed and brought to the next annual meeting for distribution, and the terms were made known upon which another edition could be printed.

The meeting of 1879 at Quincy was the twenty-fifth and the quarter centennial was celebrated by an historical review read by Dr. Koch, and by a banquet. Dr. Cushing was president, the only instance in which anyone has been twice elected to that office. He pre-eminently deserved it, for he attended every one of its meetings, from the organization till he removed to California shortly before his death, but he was also the wisest and the most trusted of all the men who guided the affairs of the Society.

At this meeting, Dr. Cushing was the chairman of a committee of nine, who were instructed to prepare and publish in the Transactions, so that it could be acted upon the next year, a revision of the constitution and by-laws, providing for an executive council that should attend to all the ordinary business of the Society. This was adopted in 1890 and since then twelve

very hard worked men have relieved the Society from all routine business and left the sessions free for professional papers and discussions.

In his historical review, Dr. Koch said that of the forty-nine charter members only six had maintained their continuous membership: Drs. Cushing, Honsinger, A. W. Freeman, Crouse, Kitchen and Ormsbee. Only one, Dr. Cushing, had never been absent from roll-call, in twenty-five years. The following sentence from Dr. Koch's paper is worthy to be printed in great big capital letters, the more so as it essentially characterizes the second twenty-five years also: *"It is a pleasant and proud retrospect that, during twenty-five years, we have escaped without even a ruffle of internal dissension to mar our steady course."*

At this meeting, Dr. Crouse made his plea, often repeated afterwards, for the Dental Protective Association.

Dr. Patrick, at the meeting of 1890 in Bloomington, read a second historical paper. "The Second Period in the History of Dentistry." This was supplemented by a list of dental publications, 396 in number, with dates from 1532 to 1841, and occupying fourteen pages of fine print in the Transactions. (A year previous Dr. Patrick had read a paper on "The First Period in the History of Dentistry.")

At this meeting the gold inlay was introduced to the Society by Dr. Ames, who described his method of burnishing a platinum or gold matrix and filling it with solder.

In 1891 at Bloomington, Dr. Harlan read a paper on "Experimental Studies on the Action of Diffusible Medicinal Agents, in Living and in Pulpless Teeth." Dr. Cattell showed a method of studying pulp chambers and canals by grinding longitudinal sections and making silhouette prints with India ink. This represented a method of teaching students introduced by Dr. Black several years previously in the Chicago College of Dental Surgery.

The men invited this year from outside the state were Dr. E. H. Angle, who gave an illustrated lecture on regulating appliances, and Dr. A. H. Thompson, who read a paper on "The Architecture of the First Permanent Molar."

Two important papers were read at the meeting of 1892 in Springfield. Dr. Black presented one on "The Interproximate spaces." This was in continuation, perhaps to some extent a repetition of a previous paper before the Odontographic Society and articles in the *Comos* in 1891 on the management of the enamel margins. The neglect at that time of great numbers of the profession to give any sufficient attention to the preservation of the interproximate spaces made necessary much talk and much writing on that subject.

Dr. T. E. Weeks of Minneapolis, read a paper with lantern illustrations, on "The Enamel at the Gingival Line." Dr. Black, in opening the discussion characterized the paper better than I can in so few words. He said, "You have had an illustrated lecture on dental anatomy in its relation to the placing of gold crowns, or collars, upon the stumps of teeth. It is, so far as I know, the first clear elucidation of this subject that has been given before this, or any other society, in which the actual anatomy as it exists has been displayed so that it could be readily seen and understood. Of course, this subject has been explained through dissections of the teeth before, but not thrown upon the screen in this way so that a whole audience can see it at once."

At the meeting of 1893 in Rock Island, Dr. E. K. Blair was president. This was a joint meeting with the Iowa Society and the sessions were held in Davenport and Rock Island alternately. Dr. Black read an important paper on "Anchorage of Proximate Fillings in Bicuspids and Molars." Dr. Patrick read a paper on "The Effect of Eruptive Diseases on the Teeth."

Dr. Harlan continued his series of papers on *materia medica*; this time on "Recent Additions to the Therapeutics of *Pyorrhea Alveolaris*," and there were two historical papers, one by Dr. J. Taft, entitled "History of the Progress of Dentistry in the West," and one by Dr. A. O. Hunt, "Iowa's Share in the History and Progress of Dentistry."

It was at this meeting that the committee on dental science and literature was reduced from three members to one.

Such a sketch as I have given you seems to me entirely inadequate to convey such information or to make such impres-

sion on your minds as I wish to give. At a time when college graduates were very few, and the journal literature was so meagre that nearly everything of value that was published in any dental journal appeared in all of the others also, the meetings of the Society were four day schools of dentistry in which some of the very best men in the country were teachers. Many of them were professors in dental schools and accustomed to impart information in a lucid and interesting way, and they had the close attention of nearly all who attended the meetings. In reading over the proceedings I have personally recognized the origin of many of my own methods of practice and habits of operating, and I am sure the same must be true of many others.

The beginning and strengthening into closer and closer intimacy of personal friendships was one of the most precious fruits of the Society meetings. In the early days, every member knew every other and made close and congenial friendships with a few. The latter may be equally true in the present large Society, but the general acquaintance must now be in limited groups and not with the whole membership.

It has always been easy to invoke the official action of the Society in support of the highest ideals and the best interests of the profession. Ten years of steady and intelligent effort were necessary to procure the passage of the first dental law of Illinois and if the efforts of this Society had been withheld it is impossible to tell how far Illinois might have lagged behind the procession of states that were passing dental laws. Equal watchfulness and effort were subsequently given to procure amendments, until now we have one of the best dental laws to be found anywhere. Some of our best men were on the first board of examiners, Dr. Cushing being secretary, and the Society for a good many years made liberal appropriations to help out the expenses of the board, for they had to serve without pay and the revenues from the law were insufficient to pay hotel bills, while making the semi-annual examinations.

The Society repeatedly gave its official support and approval to Dr. Crouse and the Dental Protective Association in the efforts, which proved entirely successful, to defend the profession against the crown and bridge patents. Very

early in its history the Society adopted a by-law which required such of its members as accepted students to insist upon a three years pupilage and graduation from a reputable dental school. (The two college courses could be taken during the three years.) At that time, every school in the country graduated after two courses, and if there had been four years of pupilage or practice one course sufficed for a diploma.

Something more ought to be said of some of the men who formed and guided the Society in its first thirty years.

Dr. Geo. H. Cushing, better than any other man, deserves the title of "father." He was a charter member and, for thirty-four years, attended every meeting of the Society. His judgment, wisdom and experience made him the most influential man in the Society during most of that time, and his tolerance and friendliness prevented him from ever sulking when he was overruled. He was a king among operators. There were only a few in the whole country his equal, and his very numerous papers, mostly relating to operative dentistry, and in the early days his clinics, had very great influence upon those who heard him, to raise their ideals of what perfect operating might be, and to instruct their endeavors to reach that ideal. But few men have won greater honor, respect and love.

Dr. M. S. Dean was a close second to Dr. Cushing in the character and weight of his influence upon the Society while he lived. Also a charter member, I believe he was present at every meeting till his death in 1882. Dr. Dean was a scholar and a gentleman, immaculate in his person, clothing, manners and speech. He was a peacemaker in the Society. Whenever the proceedings threatened to become stormy or quarrelsome a few wise words from Dr. Dean were sure to restore harmony and good-feeling. I believe that for sixteen or seventeen years he was one of the most important influences that prevented the profession in Chicago from breaking up into antagonistic or hostile cliques, as happened in some other cities. By that time, we had formed the habit of living together in peace, and learned how to do it, and we are still in the enjoyment of the fruits of his influence to this day. He gave the Society some very interesting papers, and published one book, "The Dental Follicle," which

was a translation from Legros and Magitot, with additions from his own studies.

Dr. C. A. Kitchen was less prominent in the Society than Dr. Cushing and Dr. Dean, but he was a charter member, a member of the first State Board of Dental Examiners, and a man whose judgment and opinions were trusted, and were always on the right side of every important question. He was a genial, companionable man, everybody's friend. He was one of my own close friends and I knew well the strength and sincerity of his character.

Dr. J. N. Crouse was the last of the charter members who had maintained continuous membership. He is but two months dead and well known to all of you. He was always a most active and useful member in the Society, but his monumental work was in the Dental Protective Association and the defense of the entire profession from the demands of the International Tooth Crown Company. The money value of this service to the profession is apparently but very imperfectly appreciated. It is very doubtful if there was any other man in the entire profession who had the brains, the courage, the indomitable will and the willingness, to make the great personal sacrifices necessary to accomplish what he did.

Dr. A. W. Harlan joined the Society in 1872. He was a big man, a great traveler and he had a prodigious memory for names, dates and the titles and contents of books and journals. Before the Society he gave his attention mainly to therapeutics and to drugs, in a series of papers and talks about the newer remedies and their applications in practice. He and Dr. Black were more instrumental than any others for the filling up of medicine closets at a time when many men limited their use of drugs to few or none besides carbolic acid, creosote and some preparations of iodine.

There is no man in less danger of being ignored or forgotten than Dr. G. V. Black, and I need say no more about him than what seems necessary to obtain such credit for the Society as may be reflected upon us from his work. His paper on gold foil, read in 1869 and published in the Missouri Dental Journal of July in that year remains an authority on that subject, and no

further information or directions are needed for the successful care and use of gold foil previous to its placement in the tooth cavity. His work on "The Formation of Poisons by Micro-organisms," and the duplication of Dr. Miller's work on the etiology of caries were reported and illustrated in our Society, and though the work on the physical characteristics of teeth and of filling materials and the phenomenal work on amalgam were first published in the *Cosmos*, they were explained and illustrated in the Society also. Dr. Black has been called the greatest man in the dental profession. I will not pretend to measure greatness comparatively. I do not know the great men well enough. I feel like saying that Dr. Black is great in this, that probably a greater number of dentists throughout the civilized world are doing a greater number of things better by reason of his work and his instructions than can be said of any other man in the profession.

Dr. Homer Judd was long an honorary member from St. Louis, though as closely identified with us as our own men. The last part of his life he was an active member, practicing in Upper Alton. He was a better and more influential man than I shall be able to show by anything I can say about him. He was by natural ability and much experience a teacher, and what he said in the Society was clear, concise and readily understood. We felt that he was an authority upon the subjects he talked about and he was much liked and greatly respected by everybody. He had fine literary ability and his account of the battle of Franklin is the best that has ever been written.

Dr. Edgar D. Swain joined the Society in 1867 at the third annual meeting. He was always until his death an active and influential member, whose judgment and opinion had great weight. He read a number of excellent papers and made numerous clinics. In 1876 he was president and for two years succeeding was the secretary.

I was associated with him in the same office for twenty years on terms of intimate friendship, and know well the disinterested and important services he gave to this Society and to various military organizations. He was sought for many responsibilities, both professional and military, and was for a good

while colonel of the first regiment of the Illinois National Guard in Chicago. Later he was the first dean of Northwestern University Dental School.

Dr. H. H. Townsend joined the Society in 1871 and was president in 1885. He died too soon, as we all believed, from overwork. He was slow and painstaking, but was one of the finest operators in the state, especially in gold fillings. He made long hours in his office, and at our meetings used to say his appointment book was full till August or longer. Some years before his death he took the courses and graduated in one of the medical colleges in Chicago and to some extent after that practiced medicine in the evenings. Because he had no time to read he used to employ, besides his lady assistant, a young lady to read dental journals to him while operating at the chair. Notwithstanding his phenomenal industry and the perfection of his operations, he was so timid about the prices he set upon his services that he left but little for his family. He became a worn out man and died at fifty-four years of age. He read a number of valuable papers and was always heard with pleasure. All this gives but little idea of the warm place he held in all our hearts because of his gentle and lovable disposition and his ability and conscientiousness.

Dr. T. W. Pritchett joined the Society in 1877 and was president in 1890. He has but recently left us and you all well know his strong personality, his sterling worth and great usefulness. In later years he interested himself in the anatomical articulation of artificial teeth, frequently illustrated and described it in our clinics, and while president of the State Board of Dental Examiners insisted upon its practical demonstration by applicants for the state license. Few of our men were more respected or more greatly loved.

Dr. W. T. Brophy is known to the whole dental profession and needs nothing that I could add to the honors heaped upon him at the testimonial banquet at which most of you were present. His operation for cleft palate upon very young infants, known as "Brophy's operation" was an earlier recognition of the same idea lately insisted upon by the orthodontists, that the sooner nature can be given opportunity to remedy her defect.

and the sooner her progress in a wrong direction can be arrested, and changed to a right direction, the more perfectly will she be able to work out her ideal type for the development of that individual.

Very few men have won for themselves so entirely the respect, the confidence, the admiration and love of those who know them as has Dr. T. L. Gilmer, and this can be said for the students whom he has taught in oral surgery, the patients for whom he has operated, either as an oral surgeon, or general practitioner, and the many others who know him as a sincere and generous friend, or a kindly and courteous gentleman. In a paper before the Chicago Dental Society, only a month ago, on "Etiology, Diagnosis and Treatment of Acute and Chronic Alveolar Abscess," he said, "The writings upon this subject have been voluminous; there are two classics, one by Dr. Homer Judd published in the Missouri Dental Journal in the year 1869, the other by Dr. G. V. Black, in the "American System of Dentistry." Of course, *he* did not say, what we all believe, that his own paper will rank with the other two, with the additional value of whatever has become known about the subject since the others were written.

Dr. C. R. E. Koch joined the Society in May, 1867, less than two years after the organization. Few, or none, have done such diversified and useful service in both professional and military affairs. He was secretary four years, was president in 1878, and has usually been on the legislative committee, either by appointment, or by service with them, and always on the advisory committee on the Governor's appointments to the State Board of Examiners. In his present position as secretary of Northwestern University Dental School his services are of inestimable value.

Dr. A. E. Matteson is one of our oldest members, having joined in 1869. He is always to be seen at our meetings and always has something to show, about crown or bridge work, porcelain work, or formerly about some appliances for orthodontia.

Dr. C. R. Taylor of Streator, was a man of sterling worth, and his influence in the Society was valuable. He had positive

opinions and was not afraid to express them, and for a time we thought him something of a scold, and some of his wrong impressions had to be set right. When we knew him well we found him one of the kindest and sweetest of men. He was also a very useful and influential man in the social and political life of his town.

To Dr. W. H. Taggart belongs the unusual distinction of having effected an epoch making change in dental practice. With the exception of the use of hard rubber as a base for artificial teeth, it is doubtful if any such important addition to our resources has been adopted so rapidly and widely as the making of cast gold inlays and the use of the casting process for crown and bridge work. Nothing further need be said, for every one knows him, or uses the method he developed.

Dr. H. J. McKellops of St. Louis, was known everywhere as one of the finest operators, and all who have ever seen his magnificent gold fillings have been ready to accord him pre-eminence. I believe he was the first to introduce to this Society the filling of pulp canals with the aid of chloro-percha. There is a good story of his early experience with the rubber dam. Dr. Black tells it, and probably his quotation of Dr. McKellops' words is accurate: "I went down East to see Dr. Barnum and to study his method in connection with the rubber dam. I watched him carefully and talked over the points with him, saw that he succeeded, and thought that I understood it. I came home and tried to use it. After several months of trial I gave it up and concluded that after all my pains I may not have understood Dr. Barnum. I could not get his results. I found that where I needed the dam badly, I couldn't use it, and where I could use it, I didn't need it, and I damned the damn dam and threw the damn dam away, and I don't think I will ever take it up again." He did, however, and learned to use it like all the rest of us.

Dr. W. H. Eames was more interested in prosthesis, of which he almost made a specialty. He read two papers, however, on the causes of defective enamel. He was a genial companion, an able man, and much liked by everybody. He was for a time Editor of the Missouri Dental Journal, and occupied important dental college positions.

Dr. W. N. Morrison was a frequent contributor to our proceedings, and Dr. J. B. Morrison made one of the early dental engines, which was manufactured and sold to a limited extent.

Dr. Henry S. Chase was one of the triumvirate who proclaimed the "New Departure" and wrote much in advocacy of it

These St. Louis men (not all of whom I have named), with Dr. I. P. Wilson of Burlington, and Dr. L. C. Ingersol of Keokuk, were a great addition to our strength and resources in the early days of the Society, when we most needed them, and they were always an influence for harmony and good will, and for a high standard of scientific and professional attainments.

A HISTORICAL SKETCH OF THE ILLINOIS STATE DENTAL SOCIETY 1894 TO 1913 INCLUSIVE.*

BY E. K. BLAIR, D. D. S., WAVERLY, ILL.

A careful study of the published transactions from 1894 to 1913 inclusive, reveals the fact that it has required four thousand four hundred and eleven printed pages to record the papers, reports and discussions of this society, and that the number of clinics recorded for this period is one thousand and twenty-five.

The volume of work accomplished within the society can only be comprehended by those who are willing to devote much time and energy to reviewing the complete record of its proceedings. Where full programs are given it will be for the purpose of showing the scope of work encompassed at a single meeting and the influence upon the profession at large.

To make special mention, or read the names of all who are properly entitled to credit for meritorious papers or discussions or clinics would create a list of vast proportions and overtax your time and powers of endurance. To record the trend of thought from year to year and to note the progress made will be as much as may be hoped for. For what may seem to you inexcusable omissions or the recording of data that you may deem unimportant I plead the lack of infallibility.

It is well to remember that the total active membership of our society, at its thirtieth annual meeting in 1894 was one hun-

*Read at the fiftieth anniversary of the Illinois State Dental Society, Chicago, March 23, 1914.

dred and eighty-six, and that there were present only ninety-five. This will help you to better appreciate the energy and devotion to scientific investigation manifested by those who at that time were making dental history.

The sessions of this meeting were held in the Senate Chamber at Springfield, the president, Dr. Garrett Newkirk, presiding. Governor Altgeld, in delivering the address of welcome, said: "We are glad to see you here, and I want to congratulate you and your profession in this state, upon the fact that you have an organization which, at a meeting of this kind, can call out so many of the leading members of your profession. It is only by organization, by meeting, by comparison, by interchange of thought and experience, by minds rubbing against minds, that any profession can be placed upon a high basis." Continuing, he said, "I can remember the time when dentistry was regarded with indifference, but it has advanced since that time and is now recognized as one of the most important professions." Speaking with just pride of the great State of Illinois the governor said: "It is an honor to be connected with any profession that has a standing in so great a state," and he complimented us upon the "high character of our literature and dental schools," expressing a deep interest in our educational institutions.

Dr. A. W. Harlan, responding to Governor Altgeld, acknowledged his appreciation of the sentiments expressed and assured him that it had "ever been the endeavor of the members of the Illinois State Dental Society to promote education and love for literature." Replying further to the chief executive, "that Illinois was taking the lead in many things," Dr. Harlan stated that the "transactions of this society for many years have been and are now looked upon by the profession throughout the world as among the foremost in the United States." At the threshold of what I hope may be a trustworthy recital of the forward movement made by this organization during the past twenty years, I have quoted from these high authorities, laymen and professional, calling to our minds the character of the work then in progress—the splendid sub-structure upon which we were to ultimately develop an organized working force unexcelled anywhere in the dental profession.

The papers at this meeting were entertaining and instructive. "Thirty Years Ago and Now" was the title of the annual address by the president, which proved to be a carefully prepared army record of every ex-soldier in this society. Dr. Newkirk said, "I am proud to devote a portion of this paper to short accounts of their military service and ask you to place them upon record as part of the sacred heritage of this society."

In addition to its being a justly deserved tribute to our boys who wore the blue it is in condensed form a valuable guide to those who in the distant future may be interested in the early history of our members who took part in war of 1860 to 1865. Among those of the original twenty-eight veterans who have passed to the great beyond are M. S. Dean, Colonel Edgar D. Swain, Daniel B. Freeman, T. W. Pritchett, A. H. Fuller, Homer Judd, Charles A. Kitchen, J. Frank Marriner, Charles F. Matteson, J. J. R. Patrick. Still surviving, fifty-three years after the rebellion, we are enjoying fellowship with such sturdy heroes as Col. C. R. E. Koch, G. V. Black, R. N. Lawrence, E. M. Robbins, G. D. Sitherwood, Isaac A. Freeman, E. B. David, A. E. Matteson and others. The hardships and exposures encountered on the field of battle seem to have fitted them for subsequent conflicts. Let us hope they may be spared for many years to come. Sturdy soldiers in war, in times of peace they have borne aloft the banner of professional progress.

After the president's address we were favored with the following well balanced program:

Etiology of Dental Caries, by A. H. Peck.

The Relation of the Profession to the Dental Colleges, by T. W. Brophy.

Swaged Aluminum Plates, by G. D. Sitherwood.

Amalgam Fillings, by T. W. Pritchett.

Reciprocation of Force in Orthodontia, by C. S. Case.

Operative Dentistry, by J. J. Jennelle.

Dr. Case presented clearly the value of knowledge of reciprocal force. He declared "that as a fundamental principle underlying the action of applied force in regulating appliances it should always be recognized and appreciated. This I believe the most important consideration in the constructing of dental

regulating appliances." "Those who have had little experience in this department with modern methods, can hardly appreciate the importance of this principle in the management of mechanical force, or realize the variety of opportunities for its exhibition that will be presented to a thoughtful and ingenious mind." Time has proven the wisdom of his declaration and by the application of this principle the work of the orthodontist has in a wonderful degree been simplified and made more effective. Discussing Dr. A. H. Peck's very able paper on the Etiology of Dental Caries, Dr. G. V. Black gave emphasis to his well known thought upon "the direction that investigation upon this subject must take in the future." He was conducting a series of experiments to determine the density of the teeth, fermentive processes in the mouth and certain hygienic relations for patients. With his paper on "The Relation of the Profession to the Dental Colleges," T. W. Brophy aroused a very general discussion. His reference to "the recent extension of the course of study to three years by the National Association of Dental Faculties, making it possible for the student to bestow more time upon the practical phases of anatomy, histology, bacteriology, chemistry, technology, etc., besides becoming more proficient in operative and prosthetic dentistry," met with general approval.

In 1895, at Galesburg, we find the program replete with subjects of vital importance. As an outgrowth of President Cornany's address, the publication of a pamphlet for public distribution entitled "Instructions in the Care of the Teeth" was suggested. The oral hygiene movement has grown from that day until the present time, ranking as a most important factor in the care and preservation of the teeth.

Especially interesting clinics consisted of a "Gold Inlay," by W. V-B. Ames; "Porcelain Crown with Platinum Post," by A. E. Matteson; "Porcelain Bridge, Using His Own Furnace," by W. H. Taggart; "Porcelain Inlay," by W. T. Reeves. C. R. Taylor, supervisor of clinics, closed his report with the following statement: "The supervisor of clinics desires to say that he believes that a notable advance has been reached in the construction of bridges; that the invention of the electric furnace for fusing porcelain will work a revolution in crown and bridge

work, if it does not also do the same for many other branches of porcelain work, and he believes it is the duty of this society to show its appreciation and gratitude to the inventor of this method of fusing porcelain."

The year 1896 was one of general progress. The president, Dr. W. A. Stevens, offered some criticism of the dental schools. The discussion that followed was notable, as an indorsement of the position taken by the National Faculties Association in extending the college course from two to three years. Higher education was the slogan of every speaker and many expressed the hope that soon there might be included in the statutes of the State of Illinois a law requiring each applicant for a license to practice dentistry within the state, to have attended a dental school requiring three calendar years of study, and, upon presentation of a diploma from such a school, to be eligible to examination by the Board of Dental Examiners, who should determine his right to practice. Skirmish lines for the great battle to procure proper legal enactments were forming and it is to the credit of this society that there was no lack of courage and no faltering in the struggle that was to follow. Believing that education lies at the root of all permanent progress, our colleges were urged to broaden their curriculums; applicants for admission to the profession were turned from laboratory apprenticeships to the college door and the standard of dentistry grew apace.

Hypnotic suggestion for the amelioration of pain was ably discussed by C. E. Bentley in "New Outlooks in Dentistry." He said the introduction of psycho-therapy into the practice of dentistry, by those who understand its principles, would, if it afforded no better result, at least induce a mastery of self and patient by the creation of an atmosphere in which the patient has the fullest confidence in the operator and vice versa. Another outlook suggested, couched in almost prophetic words, is the following: "If the public schools will respond to the growing demand for a larger knowledge of the structure and working the human frame, we can confidently hope for the installation of competent dentists into the school room, who may make examinations of the mouths of the children and advise them as to the correction of any pathological conditions that may exist.

It would also afford a fruitful source for the collection of data upon a wide range of subjects, the importance of which cannot be overestimated." Replying to Dr. Bentley, Dr. C. B. Rohland dissented, fearing "that the American mind which does not take kindly to paternalism in government would object to dental examinations in the schools." Fortunately Dr. Rohland's fears were not well founded as subsequent experience has proven that the public takes kindly to the examination of the teeth of school children and the public spirited work of the profession in this field is fully appreciated and approved by the masses.

The specter of cataphoresis appeared at this meeting, disappointing to all in the end save the manufacturer of appliances. The death of Dr. E. B. Call of Peoria occurred this year. In his obituary he is credited with having stamped the first seamless gold crown.

1897 and 1898 were busy years. Like trained veterans our most capable students were delving deeply into dental science. The frequently expressed opinion that as many teeth were lost from pyorrhea as from caries augmented the interest in Dr. J. W. Wassall's paper on "Pyorrhea Alveolaris," a subject we had been learning much about both clinically and scientifically. Correlatively associated with the treatment of this malady grew the study of oral prophylaxis and mouth hygiene. Pathological conditions in the oral cavity were closely scrutinized, and instrumentation more accurately performed each year became a potent factor in the treatment of pyorrhea. The prognosis of this disease, once so unfavorable, now became less so and the future held many inducements to practitioners striving to master one of the greatest problems confronting our profession. Among the themes considered during these same years were "The Principles of Force and Anchorage in the Movement of the Teeth" (Case), "Why Coagulants Diffuse Through Dentine" (York), "The Essential Oils and Some Other Agents, Their Antiseptic Value, Also Their Irritating and Non-irritating Qualities" (Peck), "Amalgam as a Filling Material" (Pruyn), "Conservatism in Oral Surgery" (Brophy), and "Ceramic Art in Dentistry, with Original Methods and Experiments" (Nyman), were ably

presented and discussed, establishing conclusions to this day unchanged.

The Society met in Chicago in 1899. President Pruyn, in his address, issued this timely word of warning: "The steadily increasing attention given to bridge-work incites me to make right here, a strong plea, for the more conservative treatment of the natural tooth crown. The improved methods of devitalization of the pulp and the filling of the pulp canal and the comparative ease of crowning, have doubtless been the cause of the destruction of thousands of natural tooth crowns that might better have been filled and saved for many years of usefulness." Good advice indeed; as much needed now as fifteen years ago. The stereopticon, so helpful in portraying accurately subjects under discussion, never proved more useful than with Dr. F. B. Noyes' paper entitled "The Structure of the Enamel with Reference to Cleavage and the Lines and Angles of Cavity Margins." With a total membership now grown to three hundred and twenty-four, one hundred and ninety-two were present and profited by the able presentation of this "one of the most important subjects with which we have to deal in filling teeth." (Black.)

"Manipulative Methods in Crown and Bridge Work," by Goslee, prepared with the author's usual comprehensive style, is a complete presentation of the best methods known to date, by a recognized authority. His advocacy of "the simpler, safer and more direct methods in opposition to less reliable and more difficult procedures" was a much needed innovation.

Resolutions were adopted expressing the confidence of this Society in Dr. J. N. Crouse's ability to direct the affairs of the Dental Protective Association.

The thirty-sixth meeting was at Springfield. Never in the history of this organization was there such evidence of potential strength in every department of our profession. Reviewed carefully, the history of this Society for more than a third of a century is a record of slow but sure advancement. Men who were toiling practitioners in its early existence, by persistent application to higher ideals had become capable scientists leading in every field of thought and action. Within the borders of our

State were located reputable dental schools occupying enviable positions among the educational institutions of the world, and with but few exceptions members of these faculties were active members of our Society. This in no small degree, accounts for the very high order of papers and clinics presented in our annual programs. Research work conducted in the school was reduced to its last analysis when presented to the Society. The annual attendant upon our sessions returned to his home after having enjoyed in condensed form the very latest teachings by the most advanced thinkers. It is not to be wondered that the influence of this organization was coextensive with the teachings of dentistry throughout the world. We gave to the world the results of our labors and with pardonable pride stood fully prepared to accept and appreciate their teachings in return. President Lawrence's address was an eloquent and timely tribute to the men of the past years, who had made this Society what it was. In addition to papers and discussions, our clinics had improved in number and character from year to year, taxing the local committees to the utmost to make provision for all who in this way contributed to the educational features of our programs. No longer were these demonstrations confined to limited operations upon the teeth and prosthetic appliances, but they covered as they rightfully should, orthodontia and oral surgery. Dr. T. L. Gilmer exhibited a patient operated upon in 1899 for "neuralgia of the second division of the fifth pair of nerves." Recovery was complete and the patient gave personally a testimonial justly complimentary to the operator. Among the numerous interesting proceedings at this convention, all of which it would be a pleasure to record, if time would permit, I find the following: "The Secretary announced the recommendation by the Council, of the appointment by the Society, of a committee of three, to select ten names of representative practitioners, five from each of the two principal political parties, from which the Governor is respectfully solicited to select the future appointments of the State Board of Dental Examiners." This was a wise procedure that should be adhered to for all time to come, in justice to the public, the dental profession and the appointive power.

In 1901 we invaded the northern territory, meeting at Rockford, where President Reid, long a competent and painstaking member of the State Board of Dental Examiners, delivered the annual address. Three days and more were given with a will to the study of live, up-to-date topics and the staging of nearly fifty clinics. Forty-nine members united, indicating a continued healthy growth. At this time great dissatisfaction and disapproval was expressed as to the origin of many diplomas and licenses finding their way into the hands of would be practitioners. A considerable number of licensed colleges were located in Chicago, with barely three or four of them reputable. Diplomas were being issued to residents of the United States and foreign countries, many of them illegal. The following resolutions presented by Dr. J. N. Crouse were unanimously adopted:

Whereas: Through the United States Consul, James H. Worman of Munich, Germany, information has come to the Illinois State Dental Society, that a traffic in fraudulent American diplomas, conferring the degree of Doctor of Dental Surgery and also dental certificates, has been carried on between residents of Illinois and residents of Germany, and

Whereas: We are informed that some of the Illinois State Dental Board Certificates presented to the authorities of Germany have been forgeries pure and simple, be it

Resolved: That, as a Society wishing to uphold the honor and dignity of the profession in the state, and to aid in the excellent work which is now being done by the Foreign Relations Committee of the National Association of Dental Faculties, in placing before the world correct information as to the status of dental educational work and dental legislation in the different countries of the world, we unhesitatingly condemn the practice in the strongest terms possible, and record our disapproval of any of these irregular methods which tend to bring discredit on the reputation of American dentistry; and particularly upon those of our educational institutions which are in reality doing excellent work in our midst."

Signed, J. N. CROUSE.

This was the beginning in substantial form, of the end of traffic by bogus colleges in fraudulent dental diplomas. Later the

war was carried by members of this Society to the National Dental Association meeting at Milwaukee and a committee was appointed that succeeded in reaching the Governor of this State and the final result was the annihilation of fraudulent colleges so long a disgrace to our profession. This triumph of right and justice over the evil influences that had so long darkened our professional horizon must be placed to the credit of this Society and the central figure in the great battle for properly authenticated diplomas was he who for many years was the only member of this Society who had been continuously a member since its organization in 1865, the invincible Dr. J. N. Crouse.

During the year 1901 death claimed an honorary member, Dr. H. J. McKellops, of Saint Louis, for years a regular attendant at our meetings. He was much admired by all who knew him. Possibly the one death of all that has most keenly affected members of this Society occurred during the same year, that of Dr. George H. Cushing. A charter member of this Society, its most persistent supporter, through all its existence, twice its President, the only member so honored, by his ability and genial qualities he had won the respect and admiration of all. When he found it imperative to seek health in another climate, this Society gave him the strongest indorsement possible to give to one withdrawing from our midst, renewed its devotion to him by messages of good cheer annually, and heard with deepest sorrow of his death far away from the field of his life's labors. In him were happily combined a brilliant intellect, superior knowledge, and a warm hearted, genial disposition. No historical sketch of this Society would be complete without a just record of the part he played in the drama of its existence and of the affection felt for him by the full membership of this organization.

In the year 1902 at Springfield some notable papers were presented. "Dental Nomenclature, with Reference to Its Development, Bearing Especially upon That of Descriptive Dental Anatomy, Cavities and Instruments," a very comprehensive and much needed study, ably presented by G. W. Dittmar. "Good Fellowship," by C. R. Taylor, was well received and is remembered to this day as highly characteristic of the author. "Professional Ethics vs. Patents," by C. E. Bently, was a clear

presentation of the subject, urging our profession to occupy the same ground relative to patenting appliances that is held by the American Medical Association. "The Present Status of Dentistry in the Philippine Islands" was read by Louis Ottofy, a former Secretary of this Society. "Conditions and Circumstances Modifying Extension for Prevention," by J. E. Nyman, and reports of "Committee on Dental Science and Literature" and "Art and Invention," by Dr. G. V. Black and H. J. Goslee respectively.

At the 1903 session in Bloomington Dr. Prothero's paper on "The Expansion of Plaster of Paris," discussed by Dr. J. E. Hinkins and others, with Dr. Case's paper on "Velum Obturators," were two mile posts on the road to progress. Twelve hundred dollars was placed in the hands of a committee of which Dr. J. N. Crouse was chairman.

The year 1904 was crowded to the utmost with problems that interested the whole Society. We had advanced sufficiently in the use of both porcelain and gold inlays to insure intelligent discussions of the technique involved in their construction and were discussing with clearness the necessary steps to be taken in the preparation of cavities. This also involved the use of cements and encouraged a more definite study of the physical characteristics of the different cements found in the market.

"The Color Problem in Porcelain Work," and "Cervical Outline Preparation" were themes that naturally invited the attention at this session. "Lest We Forget" in our enthusiasm for the new inlay methods a sturdy protest came from high authority, Edmund Noyes, reminding us that there was and always will be a place for good gold filling, properly made, and the percentage of cavities demanding gold fillings was by no means small.

At this session we heard the report of the committee appointed to revise our Constitution and By-Laws, creating District and Component Societies and preparing the way for an increased membership. Under the Rules the new Constitution proposed was referred to the 1905 meeting for approval and adoption. Our membership at the close of the 1904 meeting was four hundred and eleven, and at the close of the 1905

session it reached the splendid total of twelve hundred and sixty. This was due to the work of the reorganization committee, of which Dr. Arthur D. Black was chairman and Drs. Dittmar and Peck his associates. Charters had been granted to thirty-one new Component Societies, covering the entire State and we were entering upon a new era, a gigantic organization, well supplied with funds, with ramifications in every nook and corner of the State. Better prepared than ever to make progress in the development of dental science, we were knocking at the door of every reputable practitioner within the state, urging him to share our enthusiasm in the upbuilding of our profession and to give that which properly belonged to his patients, the benefit of the knowledge he might obtain, if he would but enlist in the greatest forward movement ever inaugurated in our profession. Our plea was more capable service to our patients, a general uplift in the scientific teachings and practice of dentistry and interwoven throughout the woof and warp of it all, a superabundance of good fellowship. As we passed from the lesser to the greater body, adding in one year more than one thousand new members, some feared that the warmth of friendships so much enjoyed in the earlier years might be jeopardized by the strenuous conditions naturally incident to the management of so many participating interests, but happily it has not been so. The increased facilities for development along scientific lines due to greater numerical strength has but added opportunity for greater social enjoyments; the heart to heart contact among fellow workers in one common field. The growth of the Society during the last twenty years is clearly indicated in the subjoined Secretary's Reports. In the year 1904 the total Active, Honorary and Corresponding Membership was two hundred and thirty-one. Annual dues, \$5.00.

Receipts, including balance from former Treasurer, Dues, etc.	\$894.03
Expenditures	465.08

Leaving balance on hand\$428.95

In the year 1913 our total Active, Honorary and Corresponding membership was sixteen hundred and fifty-seven, with dues

as low as \$3.00 per year, including dues to National Association.

Receipts from all sources\$9,008.41

Expenditures 4,634.90

Balance on hand\$4,373.51

More than ten times as strong financially and eight times stronger numerically. With ample funds at our disposal it has been possible to inaugurate and carry to successful issue any Society work desired.

The effect of the Component Society and Study Clubs has been to promote social as well as educational growth, and we come together annually with much preliminary work accomplished, better prepared to present papers and discuss them, to give clinics of every conceivable variety and to transact the routine business of the Society with commendable skill and promptness.

Give a moment's thought to the history of our progress from 1905 to 1913, inclusive. So comprehensive in area, for they covered the whole field of dentistry, 'tis possible here to mention them only in the briefest way. During these nine years our programs include one hundred and fifty-two papers and discussions, and six hundred and sixty-three clinics. As we consider them collectively, hoping to be as brief as possible, permit me to select twenty-five subjects presented, as an illustration of the wide range of topics considered:

Ethics, C. N. Johnson.

Penetration of Dentin by Fluids Under Pressure, W. A. Johnston.

The Problem of the Construction of Good Dentures, T. W. Pritchett.

A Survey of Oral Hygiene, C. E. Bentley.

Amalgam, W. E. Harper.

Conservative Plea in the Use of Anaesthetics, Narcotics and Sedatives in Dental Practice, C. P. Pruyn.

Some Phases of Prosthetic Procedures, J. H. Prothero.

The Dental Protective Association, J. N. Crouse.

Orthodontia, C. S. Case.

Microscopic Study of Cements, Geo. C. Poundstone.

Gold Fillings vs. Inlays, Don. M. Gallie.

The Cast Gold Inlay, G. W. Dittmar.

General Considerations of Syphilis, with Special Reference to Differential Diagnosis Between Syphilitic and Non-syphilitic Lesions Found in the Mouth, W. H. G. Logan.

Experience in Cast Metal, C. N. Thompson.

Impacted Third Molars, Brom Allen.

The Maxillary Sinus and Its Diseases, T. L. Gilmer.

Dental Medicine, J. P. Buckley.

Concerning the Porcelain Inlay, J. F. F. Waltz.

Reorganization, Arthur D. Black.

Some Mistakes in Operative Dentistry, Their Causes and Correction, F. W. Gethro.

What Dentists Have Contributed to Other Professions, B. J. Cigrand.

Newer Methods in Crown and Bridge Work, H. J. Goslee.

Some Phases of Bacteriological Infection of the Human Mouth, George W. Cook.

Dental Legislation, C. R. E. Koch.

Oral Surgery, T. W. Brophy.

Dental Inspection in the Schools, W. A. Evans.

The Scientific Casting of Gold, W. H. Taggart.

A Multiplicity of Subjects, G. V. Black.

And this only one-sixth of the number of papers and reports comprising the full list of the last nine years. What a galaxy of talent! I beseech you upon returning to your homes that you re-read carefully the transactions of your own Society, and you will find a record of the progress of your profession, commensurate with the Nineteenth Century, the most progressive age since the dawn of civilization. For months I have basked in the sunlight of these pages, drank deep from the recorded wisdom generously contributed by tireless authors, marveled at the brilliant ingenuity manifested in scores of methods and devices displayed by clinicians, and have been gratified indeed at the generous manner in which all is given freely to the world for the benefit of humanity. A contributing factor to our enjoyment as we peruse these transactions from year to year will be found in the lucid manner in which they have been edited. The work of

the master mind of Dr. Edmund Noyes is everywhere apparent and we are deeply indebted to him and his associates for annual publications almost faultless in every particular.

For considerably more than a quarter of a century, I have witnessed the Society's growth and during that time have failed to hear the first reasonable excuse for non-membership in this organization. When we reflect that the absentee from our meetings is denying himself the privilege so eagerly sought by our ablest practitioners in other states, who travel frequently across the continent to enjoy and profit by the educational features of our sessions, we marvel at the indifference manifested by some and regret that one and all are not within the fold.

What have been the contributing forces that have been most potential in the upbuilding of our Society?

First of all Organization. A willingness to come together for free and unrestricted interchange of thought.

Next the devotion to the Society's interest manifested by so many stalwart members who have throughout all the years remained steadfast to the Society's welfare. Their name is legion, and the record of their efforts properly drawn would form a transcript of the proceedings from year to year for half a century.

A collective organization imbued with the proper spirit, we have ever kept as our foremost tenet the proper consideration of our duty to the public.

Every legal enactment that we have sought or obtained has guarded, first the citizen, and next made more stringent the requirement for admission to practice. Our highest aim has been the preservation, not the destruction of the teeth, the maintenance of sanitary and healthful conditions in the oral cavity and surrounding tissues. Many of our members have become specialists, adding luster to our profession and contributing materially to the intellectual and scientific growth of our Society. As we have acquired knowledge and experience we have grown more tolerant, manifesting at all times great courtesy in debate.

Pioneers in the study of physiological and pathological conditions, we were first to know that which the public now generally comprehends, that through the mouth, sometimes termed

the gateway to the body, a very large percentage of the diseases that flesh is heir to, make their entrance to the system. As dentists, charged with the responsible duty of maintaining a healthful condition of the oral cavity, we are occupying a more important position in the community. Originally regarded only as the special conservators of comfort, appearance and utility of the mouth and dental organs, there have now been added the more exacting requirements of prevention of contagion and the spread of disease.

We have with a generally progressive world caught the spirit of organization, of concentrated effort. Under the very able leadership of Dr. Arthur D. Black our reorganization has been fruitful of the most gratifying results. Other states have joined in this same movement, also the National Dental Association which will doubtless have between fifteen and twenty thousand members within the next few years. The Dental Review, ably edited by our own C. N. Johnson and published within this state, has always been loyal to the State Dental Society and its interests.

Dr. Noyes in his sketch of the Society's early history has within your hearing tonight paid a just tribute to prominent members, most of whom have ceased their earthly labors.

The history of the last twenty years necessarily deals with the living, active members many of whom are within the sound of my voice. Their parts in the workings of this organization are but half played and the future historian must sum them up and accord to each his or her meed of praise. Of but one shall I make specific mention. The first half century of our existence has been made conspicuous by the labors of our own beloved G. V. Black, a devoted and insatiable student, we have known no man with such universality of interest. From his ever increasing fund of knowledge he has given freely to all. Greater than this, he has ever been approachable to the humblest inquirer. Imbued with the very highest conception of professional ethics, the results of his investigations have been contributed to the world for the benefit of humanity. How insignificant in comparison, is the mere acquirement of millions, to his devotion to scientific research.

With pardonable pride we glance back over the past one-half century so splendidly celebrated in this Golden Jubilee. We are indebted to Dr. W. H. G. Logan, our worthy President, and the committees he has organized for this superbly planned semi-centennial celebration. No asset is more valuable to any working force than that of a good organizer.

One might continue indefinitely recounting forces that have aided in the upbuilding of this Society, did time permit. We surrender to the hosts whose names are to be inscribed upon the roster of membership in the next half century. Our legacy to you is the loyal spirit that has been so persistently manifested by all in years gone by, and we bespeak for you the same degree of loyalty and devotion to the Society's welfare that has characterized its membership in the past. Keep ever in mind these truths, that our Society is great in her history, great in the character of her pioneers, great in her achievements, and great in her beckoning future.

REPORT OF THE COMMITTEE ON DENTAL SCIENCE AND LITERATURE.*

BY DR. C. B. WARNER, URBANA.

There are those who tell us that the dental profession is yet in its infancy. As we examine the wide field now covered by dental science, we find it difficult to believe that we are yet young. Fifty years ago, when this society was organized, a dental specialty was almost unknown. Now we have half a dozen well developed specialties, each with a literature of its own. There are, at this time, over a hundred dental journals published throughout the world; of which sixteen are printed in this country. In one of these magazines alone, there appeared last year over one hundred original contributions of merit. Truly, if our profession is yet in its infancy, we wonder what will be its extent on arriving at a ripe old age!

In the realm of dental science we have made great progress during the year, in all lines of work. We find evidence of this in the quality of the essays and the clinics which have been

*Read before the Illinois State Dental Society, March 23, 1914.

given. There has been some criticism offered during the year concerning the weak character of the articles published in the dental journals. In some instances this may be true, but in the main there does not appear much ground for this contention, especially if we compare the productions of this year with former years. The quality is excellent for a profession yet in its infancy. A movement which will still further improve the standard, was inaugurated last July in the adoption of plans for the immediate operation of scientific dental research. A committee of The National Dental Association has been carefully organized to supervise this work in a capable manner. This includes, not only authority to raise a foundation fund, but also power to expand the income in exhaustive research of the basic principles necessary to dental practice. The committee is now organized into a Commission, consisting of twenty-five dental practitioners selected from various parts of the country. Funds are now being raised which will start the work in good shape. Privilege for research work has been obtained in the following laboratories and institutions:

Cushing School for Pathological Research, Cleveland.

Case School of Applied Science Research Laboratory, Cleveland.

Iowa State University Research Laboratory.

Michigan State University Research Laboratory.

Illinois State University Research Laboratory.

Hygienic Department of the United States Department of Health of Washington.

Bellevue Hospital Research Laboratory, New York.

Cincinnati Hospital Research Laboratory.

Parke-Davis Research Laboratory, Detroit.

University of Chicago, and several other competent institutions.

Hitherto, dental research has been mostly conducted by self sacrificing men who carried on experiments in addition to their office practice. Now, thanks to Dr. Weston A. Price and his co-workers, these men will be given the opportunity of doing what they have long desired—to develop their ideas for the sake of humanity. As is stated in a recent report of the Commission, "It is our privilege by supporting this work, to help emancipate

society from its most universal malady and also the one that causes more total suffering, directly and indirectly, than any other."

A study of the books which have been published during the year, reveals a large and varied assortment, of interest to the dental profession. In former times on the subject of extraction of teeth, we usually found a chapter or so devoted to this important subject, either in some text-book on Oral Surgery, or Operative Dentistry. This year we have three excellent books devoted wholly to this subject, viz.: Extraction of Teeth by J. H. Gibbs, D. D. S., Exodontia, by G. B. Winter, D. D. S., and Extraction of Teeth by Dr. J. F. Colyer.

In the field of Oral Surgery we find:

Surgical Operations with Local Anaesthesia by Arthur E. Hertzler, M. D. This book is largely for general work, but devotes ten pages to operations on the mouth and teeth.

A Handbook on Surgery by A. S. Underwood, L. D. S., and B. Underwood, B. S., is a brief outline of use to dental students.

The Surgery of Oral Diseases and Malformations, Their Diagnosis and Treatment, by Dr. Geo. V. I. Brown.

A Textbook of Surgery for Dental Students, by Dr. G. Percival Mills, F. R. C. S.

In Prosthetic Dentistry and Allied Branches were published:

The Fourth Edition of Dr. Turner's Prosthetic Dentistry.

The Metallic Inlay, by Dr. H. W. C. Bödecker.

Dental Prosthetics, by Dr. Geo. H. Wilson.

A Textbook of Crown and Bridgework, by Drs. F. Peeso and A. C. Eglin.

Practical Manual of Dental Casting, consisting of papers that have appeared in the *Dental Summary*.

In the field of Anatomy are several standard works:

The 18th Edition of Gray's Anatomy is improved over previous editions.

An introduction to Dental Anatomy by Dr. Arthur Hopewell-Smith, M. R. C. S., L. D. S., is well adapted to the use of the dental practitioner who desires a knowledge of this subject, especially in its latest aspects.

The 4th Edition of the Anatomy and Histology of the Mouth and Teeth, by I. Norman Broomell, D. D. S., and Philip Fischelis,

M. D., has been revised and brought down to date, and will prove of great value as a reference book.

We have two books on metallurgy; by Dr. Chas. J. Essig and Dr. Augustus Koenig, which now comes forth in its sixth edition thoroughly revised, and Practical Dental Metallurgy, by Dr. J. D. Hodgen.

Other works of merit are:

- Operative Dentistry, 4th edition, by Dr. Edward C. Kirk;
- Baby's Teeth to the Twelfth Year, by Dr. Albert Westlake;
- Dental Materia Medica, Therapeutics and Prescription Writing, by Dr. Eli H. Long;
- Anesthetics in Dental Surgery, by Dr. Frank Coleman;
- The Prevention of Dental Caries and Oral Sepsis, by Dr. H. P. Pickerill;
- Anaesthetics, by Dr. J. Blumfield;
- The Prevention of Some Common Diseases in Childhood by Dr. J. S. Wallace;
- Medical Inspection of Schools, by Dr. L. H. Gulick and Dr. L. P. Ayers;
- Diseases of the Mouth, by Dr. F. Zinsser;
- Food Talks with Children, Dr. J. S. Engs;
- Cultural History of Dentistry in Monographs, by C. P. Proskauer;
- John Hunter and Odontology, by Dr. J. F. Colyer;
- Elementary and Dental Radiography, by Dr. Howard R. Raper;
- Pathology, General and Special, by Dr. John Stenhouse;
- Success in Dental Practice, by Dr. C. N. Johnson, 2nd Edition;
- Interstitial Gingivitis and Pyorrhea Alveolaris, by Dr. Eugene S. Talbot;
- Elements of Bacteriological Technique, by Dr. J. W. H. Eyre;
- The Prejudices in Dental Art, by Dr. A. Charezieux;
- Our Teeth—How to Take Care of Them, by Dr. Victor Bell;
- Pyorrhea Alveolaris, by Dr. Frederick Hecker.

This review of the current articles, as published in the magazines during the year, cannot be at all satisfactory or complete. With the time at our disposal it is impossible to consider only a limited number of contributions, leaving many really meritorious articles unmentioned. The magazines consulted were:

The *Dental Summary*, The *Dental Cosmos*, The *DENTAL REVIEW*, The *Items of Interest*, The *Dental Digest*, The *Western Dental Journal*, *Oral Hygiene*, The *Dental Brief* and the *Dental Dispensary Record*.

The last two journals, I regret to mention have suspended publication within the past four months. In the last number of the *Dental Dispensary Record*, published last November, is an editorial concerning our dental magazines. It says in part, "The advent of the dollar magazine has not been entirely a blessing. We are throwing out a lot of hot air about the marvelous advance of the science of dentistry, but when a publication of the standard of the *Brief* is discontinued for lack of support, it doesn't look good to us. The publishers will issue a free manufacturer's quarterly for free circulation. These free magazines would be all right if we did not have something better, they are not advancing the needs of dentistry, rather hanging at its heels and partaking of its substance. They are the 'Movies' and nickeldones of dental publishing. You can't get away from the fact that the mass of dentists are not readers or students of their own literature. More the pity." The writer also advises the National Dental Association to be content with the *Bulletin* now being published and to refrain from entering the magazine field, now being so ably filled. While we may not agree entirely with the editorial, yet it is a truth that the dental profession do not read their own literature as they should.

If the plan proposed by the last ex-president of this society were adopted largely by the profession, there would be no trouble on this score. That plan, you will remember, was not to attempt to do all your dental magazine reading at the office, where you are constantly interrupted, but to leave copies on your library table at home, where you may read the articles at your leisure, when the spirit so moves you.

A number of meritorious articles on Oral Surgery have been published since our last meeting. There is no doubt that the average dentist does not pay as much attention to this phase of his work as he should. As has been remarked, the dentist is in a position to see a great many mouths, and can render great assistance to his patients in recommending the services of a physi-

cian or surgeon when necessary, were he well acquainted with the pathology of the mouth. In this connection the following articles can be read to advantage:

Enlarged Cervical Glands, with Special Reference to the Mouth as an Etiological Factor, by George Morris Dorrance, M. D., in August *Dental Cosmos*, and The Responsibility of the Dentist in Oral Malignancy, by Arthur B. Crane, D. D. S., in the November *Cosmos*. An excellent article on the Artificial Restoration of Lost or Missing Tissues in Congenital Cleft Palate is found in the October *Dental Digest* by Vethake E. Mitchell. In the *Dental Summary* for May is found an article by George V. I. Brown, M. D., on The Speech Relation of Cleft Palate Operations. Interest is being revived in tooth extraction as evidenced by the books published this year on that subject. A series of well illustrated articles on this line written by William J. Lederer, was published in the *Dental Digest* beginning with the June number.

Orthodontia surely has an important place in the dental profession, judging from the number and excellence of articles of this nature. The series of articles in the *Dental Digest* by E. A. Bogue, M. D., D. D. S., entitled Orthodontia of the Deciduous Teeth should be read by every dentist. The Significance of Normal Occlusion, by Milo Hellman, D. D. S., in the September *Cosmos* is instructive. He emphasizes the point "That the effect of Normal Occlusion is not limited to the mouth alone, but influences the development of the respiratory passages, the face and the head, in the establishment of type."

Other articles of merit are:

The Rational Treatment of Infra Occlusion, by J. Lowe Young, D. D. S., and Studies of Anterior and Posterior Occlusion of the Teeth with Suggestions as to the Treatment, by M. H. Cryer in the July *Cosmos*.

The study of pyorrhea, and the various remedies for it, continues to occupy a prominent place in our literature. One of the articles on this subject, worthy of mention is: Pyorrhetic Instrumentation, by William Crenshaw, in the *Dental Cosmos* for October, in which the writer advises the use of a right angle edged instrument instead of the bevel edged instruments which are now commonly used. The same advise is given by Dr. Austin F. James

in the *Dentists' Record* for last October, much emphasis being laid on the point of not scarring the roots.

One thing that is noticeable in a study of the literature of pyorrhea is the great variety of alleged causes and the cures that are claimed to be effected by various methods and treatments. For instance, Dr. H. E. Bliler in *Oral Hygiene Magazine* for January, claims auto-intoxication as a cause for pyorrhea, carbuncle and appendicitis. Other writers claim hereditary causes, local uncleanness only, uric acid complications, and what not. The remedies run all the way from vaccine to formaldehyde. In the *Western Dental Journal* of last July, is an article by Dr. G. A. Barnett which gives great praise to formaldehyde as a cure. If you wish to learn how the vaccines work, read the article on Chronic Alveolar Osteomyelitis, by Dr. L. E. Medalia in the *July Dental Cosmos*.

There is still a pronounced activity in the use of gas for analgesia and anesthetic purposes. First it was Nitrous Oxid, then Somnoform, later came Nitrous Oxid with Oxygen, then Nitrous Oxid with air, and lastly Somnoform for analgesia. All of these methods have enthusiastic supporters. Articles of interest in this line are:

Somnoform Analgesia and Anesthetics by Dr. E. L. Marovec in the September *Cosmos*, The Scientific Administration of Nitrous Oxid and Oxygen by Dr. A. E. Smith in the December *Items of Interest*, The Use of Nerve Sedatives by W. H. DeFord in the August *Dental Digest*.

Dental Research will be the watch word for the next few years in the profession, not but what we have always paid some attention to this vital subject. It appears, however, that we move by spurts, and just now the subject of dental research is in the air. One of the most important contributions on this line and one that every dentist should read, is the report of the Committee on The Scientific Research of the National Dental Association as given in the November *Dental Cosmos* by Dr. H. C. Ferris.

An article by Dr. H. P. Pickerill in the October number of the *Dental Cosmos*, gives up to date information on the structure of the enamel. In the *Dental Digest* for May is an article on The Relationship of the Thyroid Gland to Dentistry, by Dr. H. Ewan Waller copied from the *British Dental Journal*. The writer begins

his article, "My reason for choosing this subject is, that in all probability the thyroid gland is one of the main factors both in the absorption and excretion of calcium. Calcium, in addition to being the most abundant constituent of the teeth, is also the principal base of the salts in the saliva, and a special study of the thyroid gland has impressed upon me the fact that where thyroid secretion is defective, dental caries is usually rampant.

"Obviously, then, we ought to inquire whether the thyroid gland is capable of influencing the teeth, and if so, in what way? And if any influence exists, which I hope to show is the case, it follows that you as dentists ought to interest yourselves in the thyroid gland, from the deficiencies of which, as I mean to convince you, your income largely flows." This article is continued in the two subsequent issues of the *Dental Digest* and is worthy of careful reading. The facts, of course, need corroboration, yet it will mark an advance in dental science if we can discover a process of rendering the mouth immune from the ravages of decay.

There are a good many things offered in the line of Operative and Prosthetic Dentistry. In the April number of the *Dental Summary* is an article by Dr. Marcus L. Ward on some changes that have been made in Dental Amalgams and the Attitude of the Dental Profession Toward Them. This is an up to date article on amalgams by one thoroughly conversant with his subject. In the *Dental Summary* of September is an able article on The Diagnosis of Diseases of the Dental Pulp, by Dr. Herman Prinz.

Dr. Ellison Hillyer presents a good exposition of the mutual arrangement of teeth in the *Items of Interest*, for September.

It has been the plan in this report to indicate merely a few of the good things that have been given us this year. There has been so much to choose from that one is almost at a loss which to select.

It appears that much of this matter might be eliminated as to different methods of the same operation, if there was some standard that could be made. Undoubtedly there is one best way to make gold crowns, but our journals describe five hundred. There is one best rootfilling, but nearly every substance in the dental calendar has been used. Here is a suggestion to our research committee, as a part of their work—that they gather all the data

necessary and recommend to us the best process for the making of crowns; perhaps the different processes could be reduced to five, these fitting different conditions arising. This would throw 495 outworn and freakish processes to the discard. I have always been glad that there were no different schools of dentistry in methods of practice, such as harass the medical practitioner. We have no osteopathic or allopathic dentists. All dentists practice methods more or less alike, and they could come much closer together in this respect if they were only taught what was the best method of performing each operation. As it is now, our magazines are loaded down with descriptions of methods either too lofty and untried for the average practitioner, or too decadent or too defective for first class operations, then there are a few methods brought out each year that are just right for all of us. If I may be permitted another suggestion to research committees it is that a board of experts be provided which will examine the merits of any dental appliance or any dental process that may be submitted to it. There are many useful inventions in the dental field that never see the light of day, except in the office of the inventor. Often the busy dentist contrives something for his own use to meet an emergency that would prove of great merit, but he has no time or inclination to exploit the invention. If such a committee were in shape to decide on the merits of new inventions sent in by the dentists of this country, it would be a wonderful advantage. As to the manufacturing end, there would be little difficulty, as dental supply houses have usually been glad to take up those articles which have such strong backing. By thus establishing a dental clearing house for our methods and inventions, our literature would be much less in amount but more effective, and dentistry would progress by leaps and bounds.

REPORT ON NECROLOGY.

Presented to the Illinois State Dental Society, March, 1914, by the Committee, Drs. Grafton Munroe, Chairman, Chas. R. Baker and Horace Tharp.

Mr. President, Members of Illinois State Dental Society:—

Permit your committee on necrology to suggest to the proper authorities the propriety and considerateness of devoting one entire

page in the front part of each annual program issue to be known as

IN MEMORIAM

page to the members who have passed from us during the year just previous to the meeting.

Ladies and Gentlemen—More enduring than the tablet inscribed with the name of him whose last resting place it marks, is the friendship of those who form our circle of acquaintance amidst the activities of life.

Time and space do not permit to gather such data for the records of our society; we must content ourselves with brief notices of the passing of those whose genial faces and various activities have been a part of our annual meetings.

DR. CHARLES FRANKLIN HARTT,

for thirty three years a practicing dentist in Chicago, died June 17, 1913, at his residence, 6434 Woodlawn avenue. He was born in Mendota, Ill., in 1859. He was a member of the Chicago Dental Society and of the South Shore Country Club. He is survived by a widow, two daughters, and one son. The funeral was held June 20, at Oakwoods Chapel, Chicago.

While Dr. Hartt's name does not appear perhaps, in the list of our State Society members, his membership in a component society makes him one of us.

DR. JOHN NATHAN CROUSE.

died at his home 2231 Prairie Ave., Chicago, of heart failure, Jan. 16, 1914. Dr. Crouse, the son of Daniel and Mary (Mowrey) Crouse, was born near Downingtown, Chester Co., Pennsylvania, Sept. 15, 1842. Educated in the village schools of Pennsylvania and Illinois, and later in Mt. Carroll Seminary, Mt. Carroll, Ills.

He commenced the practice of dentistry in 1864, on the strength of the knowledge he gained from another, 1867 he received the degree of D. D. S. from the Pennsylvania Dental College and after graduation he practiced about one year in Mt. Carroll. In 1868 he moved to Chicago, where he remained in practice until his recent illness and death. He was a kin folk of strenuousness and was not only busy with the increasing demands of his dental practice, but devoted much time and energy to the advancement of dental professional interests. It is a sore calamity that our society should lose him, especially at this time, when

he, our only surviving and continuous charter member was to have been a conspicuous figure in this great meeting which marks our semi-centennial. It is a remarkable coincidence that the death of Dr. Crouse occurred on the fiftieth anniversary of the organization of the Chicago Dental Society, of which he was a member from 1868 till his death. He was also a member of the National Dental Association and the Dental Protective Association. In all of these societies he had held the office of President.

Besides being founder and president of the Dental Protective Association, he was president, treasurer and director of the Dental Protective Supply Co. and publisher of the *Dental Digest*. These three lines of work were enough for the full measure of endeavor of an ordinary man. The manner in which he pursued his duties as devolving upon him because of his connection with these enterprises was but an evidence of his strong personality and his capacity for work. He was a natural leader among his professional colleagues, and with all his might and main he did his best as he saw it.

In the midst of his greatest efforts for the good of the profession he was however often criticised because he was wrongly understood. His generosity was unbounded and he gave of his time, means and personal efforts to serve the interest of his friends and his profession even down to the end of his life.

Dr. Crouse was married in 1870 at Clinton, N. Y., to Miss Ruma Arvilla Hull, who with one son (Dean) survives him. His body was cremated and the remains interred in Rose Hill Cemetery, Chicago, Jan. 19, 1914.

DR. GEORGE WASHINGTON COOK

died in Hebron, Ind., Jan. 21, 1914, after a short illness, due to Apoplexy. Dr. Cook was born in Kentucky in 1866. His parents being greatly reduced in circumstances by the War they migrated to new scenes and came to Southern Illinois and located in Harrisburg. Being orphaned at the early age of eight, and with other children in the family, Young Cook found it necessary to live in the families of farmers of the neighborhood. At the age of eleven years he went to live with Dr. Hastings near Carbondale, Ill. He worked faithfully at all sorts of work while he was getting his early education, and by his faithful application and attention he

soon learned to assist Dr. Hastings in administration of anesthetics for surgical operations, and at the odd times studying Anatomy and Physiology, dressing wounds and extracting teeth. At sixteen he obtained a position in the Southern Illinois Hospital for the Insane, and from the Medical Staff at this institution he gained valuable training.

When cocaine was first introduced he made a long series of valuable experiments with this drug for the relief of pain. After having attended the Northwestern Dental College for one year, Dr. Cook went to University of Iowa, where he received his degree of D. D. S. in 1890.

Studying a year with Dr. L. P. Haskell, he thereupon took up the practice of dentistry (in 1891,) in Chicago but continued with unabated energy his studies in bacteriology and pathology. During 1895-96, in Dr. Fenger's Clinic he made a study of tuberculous infection through carious teeth. Dr. Cook was professor of Oral Surgery at Northwestern College of Dental Surgery. He was a member of the National, as well as the several Chicago societies, honorary member of the Southwestern Dental Association of Michigan, member of the World's Columbian Congress, 1893, president of the Chicago Dental Society in 1900, and in the same year, delegate to the International Dental Congress in Paris.

He was a prolific writer on subjects pertaining to science and practice of Dentistry. For a number of years he was Dean of the Illinois school of Dentistry, later he was professor of bacteriology and pathology. For the last few years he has been interested in farm life at Hebron, Ind. He was married in 1907 to Miss Margaret McGill, who survives him. He was stricken very suddenly on Saturday, Dec. 20, and died the next day. Thus another of the Princes of men has passed from us to the great beyond, where mortal man puts on the garments of immortality and enters the state of reward, according to the deeds done in the body.

I see the spire,
I see the throng,
I hear the choir,
I hear the song;
I listen to the anthem, while
It pours its volume down the aisle;

I listen to the splendid rhyme
 That, with a melody sublime,
 Tells of some far-off, fadeless clime—
 Of man and his finality,
 Of hope, and immortality.

Oh, theme of themes
 Are men mistaught?
 Are hopes like dreams,
 To come to naught?
 Is all the beautiful and good
 Delusive and misunderstood?
 And has the soul no forward reach?
 And do indeed the facts impeach
 The theories the teachers teach?
 And is this immortality
 Delusion, or reality?
 Yea—verily—Reality.

DR. B. M. FORD.

Died, 1913. A graduate of Northwestern Dental College, 1893. Practiced in Chicago. Formerly of Crystal Lake. Was in Real Estate business in Chicago for several years before his death.

DR. JAMES PHILIP JOHNSON

was born in Chicago, Oct. 23, 1880. Died in Denver, Colo., Mar. 9, 1914. Member of Englewood Component Society up to one year ago. He attended the public schools of Chicago and in 1898 was graduated from the J. H. Bowen High School. Attended Ann Arbor and finished his dental course at Northwestern University Dental School in May, 1901—receiving degree D. D. S., and thereupon established an office in South Chicago.

DR. J. B. BROWN

of Bloomington died at the Kelso sanitarium, of cancer of the stomach, following an illness of about three weeks. He had practiced in Bloomington twenty years. Dr. Brown was a member of the Christian Church, and was also prominent in the Prohibition party, being a member of the County Executive Committee.

A REPORT ON EXPERIMENTS ON ARTIFICIAL INJURIES TO THE PERIDENTAL MEMBRANE OF DOGS.*

By Frederick B. Noyes, B. A., D. D. S.

Mr. President and Members of the Chicago Dental Society:

In presenting this matter to you, I shall give simply an informal report of the present conditions of some investigations which we have been trying to carry on this winter. The work is not completed and no conclusions can be drawn from it in its present condition. In this work the operations on the animals were made by Dr. F. B. Moorehead. The histological preparation and section cutting was done by my assistant, Dr. Virgil H. Moon, who has also studied the sections with me.

In the executing of this work there have been many difficulties. First, our arrangement for keeping and caring for experimental animals was in the process of reconstruction; the animal keeper was changed during the work; and a number of the animals, after being operated upon were lost. The first dog was all chewed up by its companions and so badly injured that three days after the operation it was necessary to kill it. A number of the animals were used for operation in the pathological department of the Medical School after having been operated on and had to be killed before they had been kept a sufficient length of time. Finally, mange broke out in the dog house, and all of the animals had to be chloroformed. Whereas it had been the intention to keep some of the animals for at least three months, only one or two were kept for three weeks after the operations. Consequently, much of the material was duplicated, practically. Specimens taken from three animals—dogs 1, 4, and 5—illustrate well all that is found in the entire series. Specimens were secured from all of the animals except the ones which were lost, and more than five thousand sections were cut from fifteen or twenty different injuries.

The object of the series of experiments was to study the reaction of the tissues in artificial injuries of the peridental

*Read before the Chicago Dental Society.

membrane. In studying these reactions, it must be borne in mind that they show reaction of normal tissues to an artificial injury, and we can not argue directly as to what would occur in

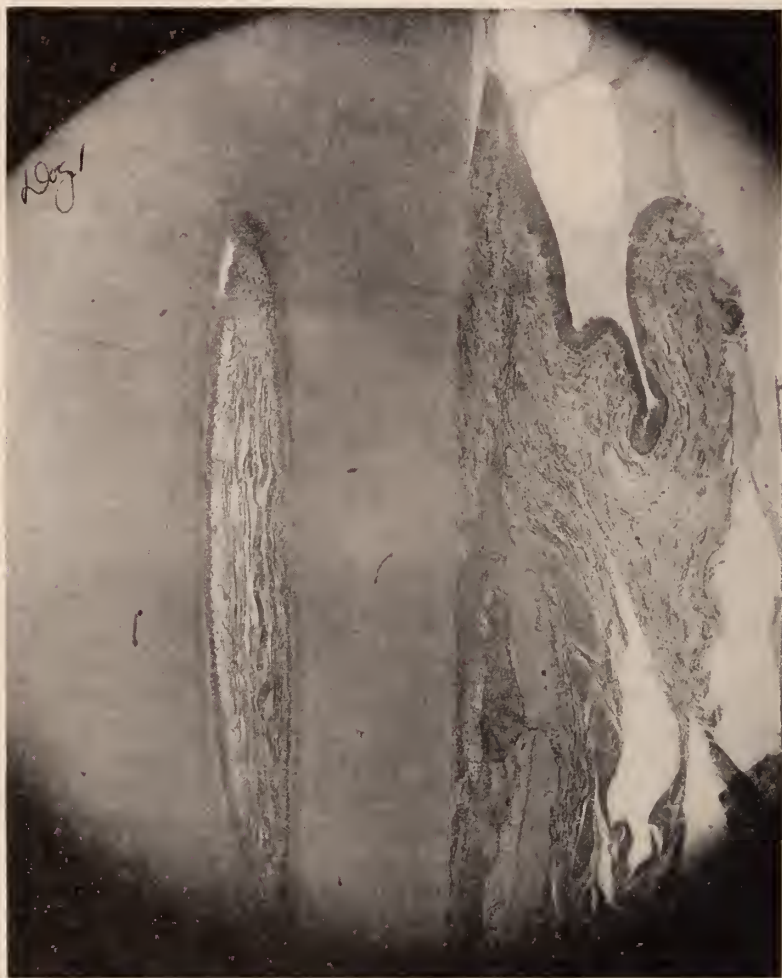


Fig. 1—Dog. No. 1. A section showing the track of the chisel, three days after injury. (A narrow chisel was driven from the gingival space through the periodontal membrane between the root and the bone of the alveolar process.)

regenerations of tissues destroyed by pathological process; also, that regenerative processes in the mouths of dogs are remarkably active.

Three series of experiments were undertaken: first, simple trauma: (injuries made with sterile instruments); second, irritative injuries. In this series, after the injury had been produced, the wound was swabbed out with a more or less irritative drug. For this purpose, oil of clove, 95% phenol, and formocresol were



Fig. 2—Dog No. 1. A higher magnification, showing the deep portion of the chisel's path.

used. It should be remembered that these agents were used simply to produce more or less irritation, and not to test any of their physical properties. The third series was one of infected injuries. In these animals, after the injury had been produced,

it was infected with a known culture: a mixed culture of streptococcus viridens and fusiform bacillus grown on blood-agar was used. Only two animals appear in this series and they were killed so soon after operation that the experiment was practically valueless.

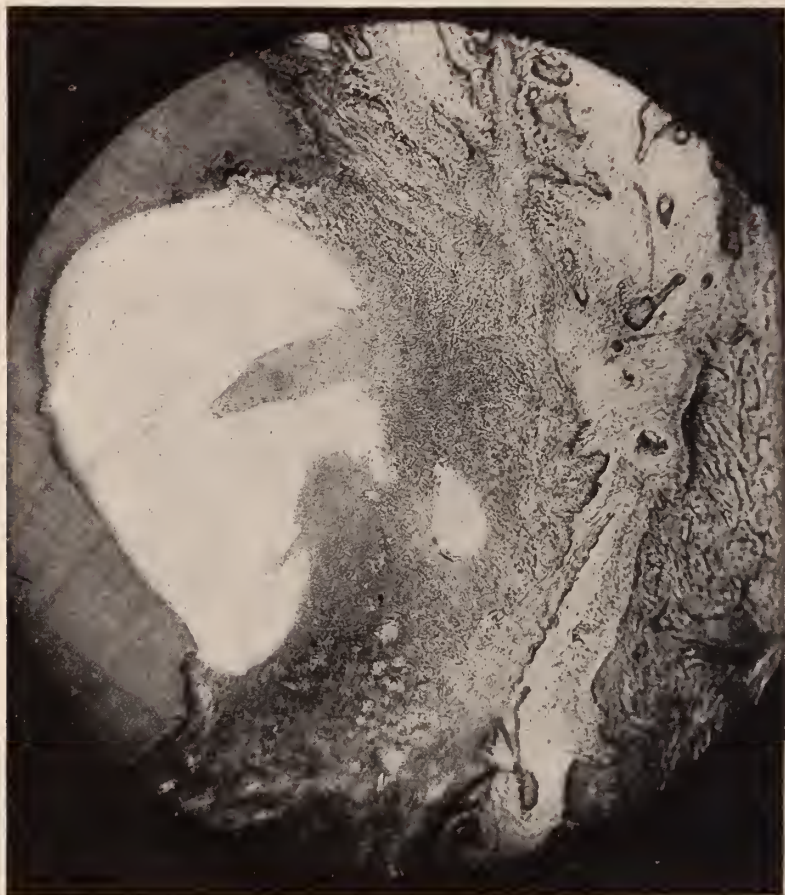


Fig. 3—Dog No. 5. Section showing the path of bur, space filled with serum, young granulation tissue, absorption on the root, repair in the bone.

In the case of the first dog, the injury was made by driving a "ten" chisel in the gingival space down along the root as close to the tooth as possible. The chisel was then loosened and

driven down again, passing approximately two-thirds of the dis-

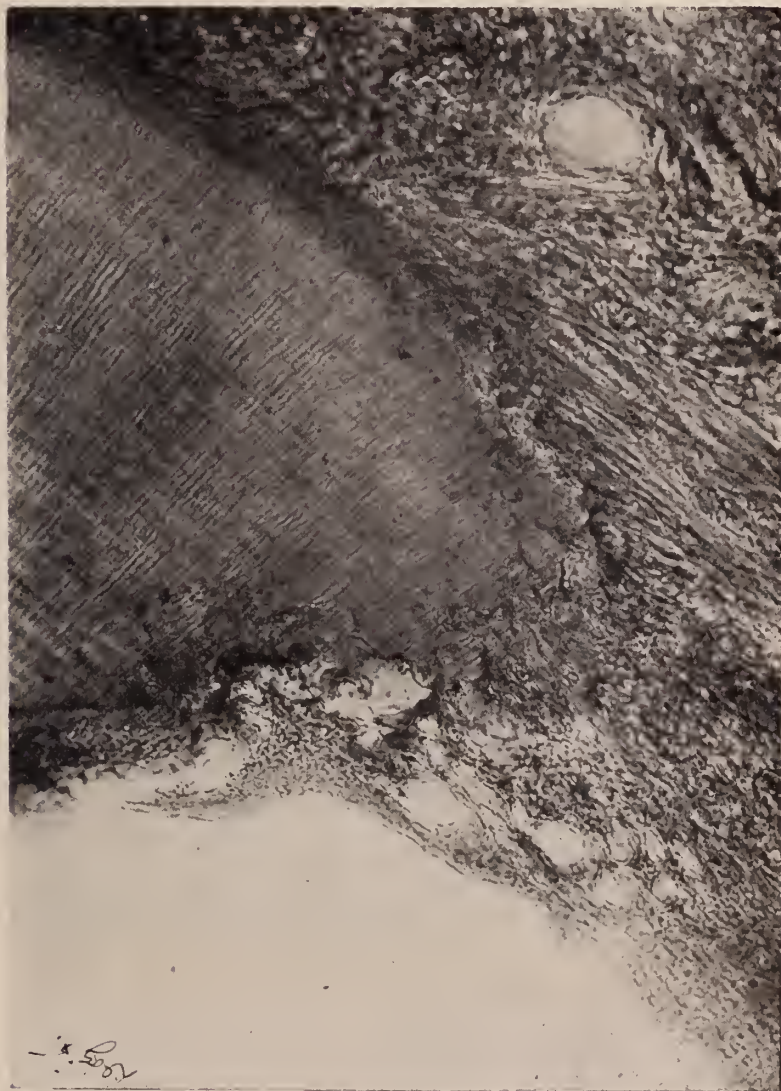


Fig. 4—Dog No. 5. Corner of the root shown in No. 3 more highly magnified, showing the absorption and rearrangement of fibres.

tance to the apex of root.

For the rest of the animals, the injuries were made with a bur in the dental engine. On the upper teeth, the instrument was carried through the gingival space as close to the surface of the tooth as possible on the labial side, destroying the peridental membrane, bone and a portion of the root. On the lower teeth the bur was carried through the alveolar process from the labial, attempting to reach the peridental membrane in the alveolar portion, producing injury not involving the gingival space.

Figures 1 and 2 show sections from dog No. 1, and are interesting only as showing the track of the chisel. It was too soon after the injury for any regeneration and the injured area is seen filled with hemorrhagic exudate. Figures 3, 4, and 5 are from dog 5 about twenty days after the injury. It is easily seen that a portion of the root was destroyed and also a considerable area of bone. The clear space in this section was undoubtedly filled with serum into which granulation tissue was growing rapidly. The surface of the dentine left by the bur has been covered with the film of granulation tissue lying in contact with it. At several points beginning absorptions are seen. It is interesting to note that apparently the first absorption areas to appear are on the surface of the root beyond the surface of the injury.

These are shown in Figure 5. Figure 4 shows a portion of the root at the margin of the injury. There has evidently been considerable absorption and apparently some rearrangement of connective tissue fibres, and probably some new attachments. On the surface of the bone in these illustrations, 4 and 5, many areas of repair can be seen.

Figure 6 is from dog 4, an injury not involving the gingival space. In this case, the entire area of the injury has been refilled with young connective tissue which is apparently rapidly taking on the typical arrangement of the tissues.

To complete this series of experiments, it will be necessary to keep some of the animals alive at least three months after the operation. While the material from the present series of experiments presents many interesting and suggestive fields, much more work should be done on the subject before making a final report.

(Note—Sections were cut from those marked with a star (*).

Dog No. 1—Dec. 12, 1913. Simple trauma. A 10 chisel was driven down into the tissue as close to the surface of the root as possible on the labial side. 12-15-'13—The dog has been all chewed up by another dog. Chloroformed and tissues removed.

*No. 1. Lower second incisor.

Dog No. 2—Dec. 12, 1913. Lost.

Dog No. 3—Dec. 17, 1913. Lost.

Dog No. 4—Dec. 31, 1913. Small black and white fox ter-

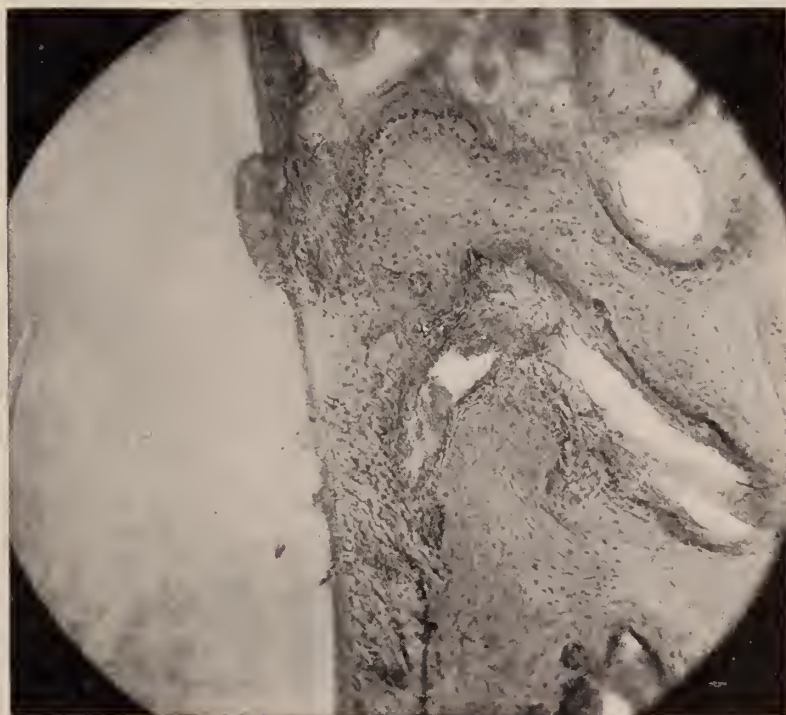


Fig. 5—Dog No. 5. Field showing absorption quite far removed from position of injury.

rier. 1. Upper right canine. 2. Upper right first molar. 3. Upper right second premolar. A round burr was started at the gingival space and carried as far as possible towards the apex of the root, cutting away part of the root and part of the bone. 4. Lower right third premolar. *5. Lower right second incisor. *6. Lower right canine. Injury made by carrying the burr

through the process from the labial and cutting into the tooth, attempting to reach about the middle third of the root, and not involving the gingival portion. Jan. 19, 1914. Dog has been in medical department. Had to be chloroformed. 1. Shows recession of gingival line and slight inflammation. 2. Marked recession of gingival line. 3. Slight recession of gingival line.



Fig. 6—Dog No. 4. Area of tissue destroyed by the bur completely filled with new connective tissue, slowly taking on typical form and arrangement.

4. Shows scar but no appearance of inflammation. 5. The same. 6. No appearance of scar.

Dog No. 5—Dec. 11, 1913. Irritated injury. Small black and white, long haired. 1. Upper right first molar. Formocresol. *2. Upper right third incisor. Clove. *3. Upper right first incisor. Phenol. Injury made in the same way as No. 4, and the wound swabbed out with the indicated reagent. *4

Lower right third incisor. Formo-cresol. No other injuries were made; dog taking the anaesthetic badly. 1-19-'14. Dog chloroformed and jaws removed. 1. Some sluffing of gum. 2 and 3. No indication of injuries. 4. Slight swelling.

Dog No. 6—Jan. 7, 1914. Simple trauma. Good-sized mongrel. 1. Upper right third incisor. 2. Upper right canine. 3. Upper right second premolar. 4. Lower left canine. 5. Lower left third premolar. 6. Lower left first incisor. 7. Lower left third incisor. All injuries made as dog No. 4. 4, 5, 6, and 7 not involving the gingival portion.

Dog No. 7—Jan. 7, 1914. Irritated injuries. Small black and tan. *1. Upper right first incisor. Phenol. *2. Upper right third incisor. Formo-cresol. 3. Upper right canine. Clove. All injuries made as dog No. 5. *4. Lower left third incisor. Formo-cresol. 5. Lower left first incisor. Phenol. 6. Lower right third incisor. Clove. 4, 5 and 6 do not involve the gingival space.

Dog No. 8—Jan. 14, 1914. Irritating injury. Small white, tan face. *1. Upper right first incisor. Clove. 2. Upper right third incisor. Formo-cresol. 3. Upper right canine. Phenol. Made the same as dog 5. 4. Lower right first incisor. Clove. *5. Lower right third incisor. Formo-cresol. *6. Lower right canine. Phenol. 2-2-'14. Dog has been operated on by Dr. Davis; killed by cyanide of potassium. Atrophy of enamel shows in the premolars. 1. Shows no indication of injury. 2 and 3. Decided dip of the gingival line. 4, 5, and 6 show no mark.

Dog No. 9—Jan. 14, 1914. Simple trauma. 1. Upper right first incisor. 2. Upper right third incisor. 3. Upper right canine. 4, 5, 6. Lower right first incisor, third, and canine. Injuries made the same as dog 4.

Dog No. 10—Jan. 23, 1914. Infected injury. 1. Upper right first incisor. 2. Upper right third incisor. 3. Upper right canine. 4. Lower left canine. All wounds infected with a mixture of ordinary staphylococcus and capsulated streptococcus.

Dog No. 11—Jan. 23, 1914. Dog killed by the anaesthetic.

Dog No. 12—Feb. 2, 1914. Infected injury. 1. Upper right first incisor. 2. Upper right third incisor. 3. Upper right first premolar. All wounds infected with a mixture of streptococcus viridens and fusiform bacillus, grown on bloodagar.

REMINISCENCES OF SEVENTY YEARS' PRACTICE.

By Dr. Loomis P. Haskell, Chicago.

(Continued from the August Issue.)

My preceptor was one of the first dentists to use plaster instead of wax for impressions, using the ordinary plaster. He was one of the first to make suction plates, as up to that time narrow plates were used and held in place with spiral springs, curved around the cheek and attached to the teeth between bicuspid and molars. If it was only an upper set the spring was attached to a band on a lower molar.

The first suction plate he made he tested the adhesion by soldering a loop to the middle of the plate, hanging a long iron wire to it, the patient sucking up the plate. An ordinary water pail filled with water was suspended to the wire. No further use of the springs, and yet in London in 1898 they were being used.

It will be observed that the plates were fitted snugly to the membrane. Some years later the air chamber was introduced by a dentist named Gilbert, the same as now used.

The first dies were of tin and lead counter dies. As it is impossible to pour lead onto tin without adhesion the counter die was made first by drying the plaster model and holding it in the lead till hard, then placing a rim of paper around the counter die and pouring the tin. Fairly good dies were made. Later zinc was used.

Many dentists used the single gum teeth, and here was a difficult thing to accomplish, fitting them to the plate, making good joints and getting good occlusion with the natural teeth, grinding with the poor emery wheels.

In those days every tooth was on a plate, from one to the full set, and had to be backed and soldered.

For several years we soldered with an alcohol lamp and a mouth blow-pipe. Soldering a full set of gum teeth was no fool of a job. The introduction of gas was a great boon.

The finishing up of a soldered case was far more difficult than now. We had no engine burs nor small carborundum

stones. The finishing was done with files, chisels, scrapers; no felt wheels, used only brush wheels.

We had few checked teeth in soldering. Sometimes a sprung plate.

A dentist who became a noted member of the profession many years later began in this way. He was pastor of a church and a man of imposing appearance. He would go with some member of his family or a friend to witness the placing of a pivot tooth with a wooden pivot, or witness the filling of teeth. He was a close observer and made a note of everything. Next he procured some instruments and practiced on his friends and parishioners. He came to us and said if we would show him how to swage plates he would give us orders for teeth, which we did.

After a time we noticed that his models were remarkably smooth. He told us that after taking the impression and getting the model after recent extractions he pared the model quite smooth and had the patients wear plates made on those models. He must have had remarkable powers of persuasion.

Another remarkable case in my experience—a dentist living far from Boston called with the models for full denture. He wanted plates swaged, teeth made and mounted. I said: "You have not provided any guide for making the teeth, a bite. Take your models home and send me what is needed."

In a few days the models came back, saying he could not provide what I wished, and as the patient was in haste to leave town, to do the best I could.

I arranged waxes on the plates, placed in articulator, made carving models, made the teeth, mounted, just guess work from beginning to the end, and sent C. O. D., supposing he would be obliged to keep them for specimens.

Six months later he called and in response to my inquiry said the teeth were all right, patient was pleased. Don't this look like a fairy tale?

I was taught to fill teeth, but not anything like the present day, in methods, materials or appliances. Yet I seemed to have success. A large upper molar was filled, the buccal wall was so thin it broke away, but I kept on. Eleven years later I was in Chicago, the patient called on me. I examined the tooth, called

Dr. Allport to examine it. He said it was saving the tooth all right.

I had determined to make the artificial work my specialty, and stuck to it.

(To be Continued.)

THE DECIDUOUS TEETH AS A FACTOR IN HEALTH.*

By Oscar Hammer, D. D. S., St. Louis, Mo.

The twenty deciduous, temporary, or primary teeth, deserve and should receive the same careful attention from a prophylactic, therapeutic, mechanical and scientific view point as usually becomes incumbent in the consideration of the permanent set. Albeit—the destructive tendencies of disorder and disease, frequent amongst the teeth in adults, may to a greater or lesser extent be looked for in the deciduous set; namely—cavity decay, pulpitis, pericementitis, various degrees and stages of abscesses, also various diseased conditions of the oral cavity, with the possible exception of pyorrhea alveolaris, though the writer has seen distinct cases of gingivitis, while irregularities of the primary teeth are rare; that is from the standpoint of contact and occlusion.

The dentist is, therefore, compelled to meet these conditions as they arise in daily practice, knowing that the correction of diseased conditions in these teeth are essential to reach and maintain healthful oral conditions, and realizing also that oral hygienic conditions are essential in maintaining in a very large measure general health.

Unnecessary to enumerate each and every phase of pathological condition of these primary teeth, it will no doubt suffice to mention a few exceptions to rules and college teachings, together with some contradictions to family traditions.

Presenting first, cases of difficult dentition, in which the family physician is usually in evidence, it is my opinion that dentists familiarize themselves with these conditions and that dentist and physician advise along these lines.

*Read before the St. Louis Dental Society May 5th, 1914.

Commencing to form some months before birth the primary teeth do not begin to erupt until about the fifth to the seventh month after birth; it might, therefore, be well, in view of all that is to be considered, that dental services begin at this time.

In most cases of eruption of these teeth, matters go on perfectly with the possible exception of a variance of the time of appearance, either prematurely to the time, or are retarded several months; while there are cases in which no tooth has erupted until the first year and others where one and a half years have passed before there are even signs of eruptions. Eliminating the extreme abnormalities, and allowing liberal deviations from rules, the entire set of teeth should be in place before the third year.

Nevertheless in some cases, before eruption of these teeth and during this period, local and systemic disorders arise; that is irritation, severe pressure and inflammatory symptoms, pain, heat, swelling and redness, resulting in loss of appetite and necessarily lack of proper nourishment and resulting in a disordered constitutional condition, which can only be remedied by systemic treatment and change of diet and the like; together with proper local treatment, such as warm applications to face, especially in the vicinity of the mouth and ear, where severe pain is usually manifested. Contrary to the opinions of many, I am a great advocate of lancing, as where the tooth is retarded by the appearance of dense tissue, an incision usually gives immediate relief. Lancing at some period, even before the tooth erupts, I have found to be beneficial, in that it relieves a pressure which sometimes causes much discomfort, loss of appetite, loss of rest by the continual irritation, although the tooth is as yet some distance from appearance. This lancing, and thorough bleeding of the gums as a rule, I find, dispels these discomforts, usually, immediately relieving the tension.

The primary teeth are not only an important factor in the conditions that lead to the correct eruption of the permanent set, but are as important to the healthful development of the child as are the normal permanent teeth to the healthful conditions of adults.

One of the first things after a child is born is the careful washing out of the oral cavity with a solution of boracic acid;

this is continued for a period, but I am sorry to note is, in most cases, lost, and sometimes at the very time when the teeth commence to make their appearance; this should, however, not be the case, but this treatment should be continued by the mother or nurse until the child is able to properly brush the teeth and wash the mouth.

This is mentioned from two view points; namely, first, to form a valuable habit of oral cleanliness, and secondly, to insure against diseases of the teeth and mouth, as we are all aware that nearly every disease germ is found in the mouth and is likely to develop more rapidly under unclean environments.

After eruption, the phase of preventive measures calls forth our efforts, and these are in the most part the obtaining and keeping healthful conditions, also oral prophylaxis, as stated before; these, however, in the most part fall short of the desired mark, therefore the dentist's mission is, to a greater extent, one of correction and restoration; correcting firstly diseased conditions or restoring lost structure.

The eruption of the deciduous teeth or dentition is a normal physiological process. Other disorders that arise during the time of dentition are only coincident with it, and are not primarily caused by the eruption of teeth. Assuming then, that during the period of dentition, the proper antiseptic care has been taken avoiding mouth infection and the like, by care of the surroundings, utensils and materials used for the purpose of feeding, etc., let us proceed to the period when all these, or nearly all, are in place. This, I believe, is the critical time concerning the child's physical development in every regard.

Therefore, the very source, that is, the means by which all that may go into the system, should be as near the ideal of perfect cleanliness as is possible. The utmost hygienic care, insuring against disease, treatment thereof when it does arise, and restoration of destruction becomes the paramount issue now, and must be accomplished by a thorough systematic procedure. Food debris that may accumulate between the teeth should be removed, destroying fermentation and rendering the micro-organisms in such a condition that further dangers to other parts become minimized by making their habitations unpopular.

Frequent examinations, impressions and models should be

made noting the relative positions of these teeth, and as the child progresses in age the primary teeth are commencing to make way for the permanent teeth, radiographic negatives may be made from time to time, showing the amount of absorption that is taking place in the deciduous teeth and the position of the permanent tooth.

One of the first matters engaging our attention in the deciduous teeth is the lodgment of food in the proximal cavities of molars, causing much discomfort, dangers to further trouble and making perfect mastication impossible. This condition when brought to our notice must be corrected at the earliest possible time and after careful preparation and disinfection of the cavity may be immediately restored to proper contact and occlusion, with one of the many filling materials, as cement or amalgam, as the case may indicate.

Though of rather rare occurrence, as compared with other classes of cavities, the cavities in the cervical region are generally filled immediately after careful preparation and disinfection, with a copper cement. I find these cavities are usually not as sensitive as in the permanent teeth. Simple occlusal cavities in the molars should be restored with amalgam or gold. In these cases I always use one of the forms of mat gold, on account of its rapidity and ease of manipulation.

Cavities found in the anterior deciduous teeth are amongst the most difficult that we are called upon to restore, on account of the smallness of these teeth and frailty of the walls. In these cases it many times becomes necessary to remove the pulp in order to gain proper access and retention; this, unfortunately, is done in some cases where there is not as yet an encroachment upon the pulp, although where we find these cases there is already a tendency of decay so deep that to endeavor to cap or save the pulp is almost impossible.

I am compelled to add here, however, that some intelligent parents, when they observe a slight defect in the anterior teeth, are in haste to call the dentist's attention to it more rapidly than the defects would be noticed in the posterior teeth. Therefore, in this regard, and by prompt attention, many pulps are saved, and much time and pain are spared.

The materials mostly used in restoring the primary teeth

are amalgam, cement and gold. In my practice I use little amalgam, however. In restoring the anterior teeth some of the forms of artificial enamel will be found to be of great value on account of harmony of color where same can be properly shaded.

Simple occlusal cavities, as stated before, are usually restored with one of the forms of mat gold, while amalgam, gold or a good copper cement is used in the restoration of proximal cavities, such as the compound mesio-occlusal, disto-occlusal, linguo-occlusal, bucco-occlusal, etc., with the virtues of copper cement predominating.

Now passing from an important phase of the subject to one of still vaster scope, the correction of pathological conditions found in these primary teeth, we are called upon first to meet the nerve-racking, peace-destroying pulpitis, inflammation of the pulp, or active hyperemia of the pulp. These cases, whether acute or chronic, should be devitalized; however, not devitalizing immediately, first, after removing outside interference, oil of cloves, eucalyptol, or eugenol should be sealed in cavity for one or two days, after which arsenic fiber should be placed in same either with a temporary stopping or a cement, one easily removed.

The use of arsenic is contrary to the opinion of many on account of subsequent dangers, nevertheless it acts quickly and I have seen no ill results therefrom when same is used with proper care.

The devitalizing agent remaining in the tooth twenty-four hours, never longer, the pulp is removed under the necessary precautions, and the canals treated as the conditions warrant, usually again sealing in oil of cloves or one of the other essential oils for a period of forty-eight hours, when the canals are filled with mummifying paste or Buckley's "Eucapercha," or a paste made of salol and cinnamon, also sometimes filling the canals with wax. All of these remedies and canal fillings allow root absorption, an important factor to be considered.

On account of the large apical opening of the deciduous teeth, the treatment of the various degrees of abscess is but a form used in the treatment of the permanent teeth, avoiding, however, the frequent use of escharotics, though when used neutralize with bicarbonate of soda, so no danger is done the deli-

cate surrounding tissues. Where there is a fistulous discharge, after the decay is removed and cavity washed with tepid water, forcing a fifty per cent solution carbolic acid, always neutralizing with proper agents, usually meets the requirements if followed at intervals of each day or every forty-eight hours. Before filling the canals a dressing of Black's 1-2-3 should be allowed to remain in canals one or two days, as the conditions warrant. The root canals and the tooth may now be filled.

In the treatment of abscessed and putrescent conditions of the primary teeth, there will also be found of value the following: At the first visit the pulp chamber should be opened, and a treatment of formocresol sealed in the cavity; after one or two treatments of this character the canals will usually be found sterile, when they may be filled with a paste made of thymolized calcium phosphate mixed with the formocresol as a liquid; this is the "Buckley Method," and in most cases where same is used, absorption of the roots takes place as well as can be expected, thereby allowing the tooth to egress as easily as possible. In the treatment and filling of these primary teeth, there, of course, is a consideration of importance as valuable as the care of the permanent teeth, nevertheless, it becomes expedient at times to lay aside rules and meet the occasions as judgment demands.

Extension of cavities to points of immunity must be governed by the case at hand, age of the patient, and general conditions. Preparation of cavity and insertion of filling, etc., while not always done under the same auspices as in the permanent teeth, the rules must be followed none the less to get the best possible results, and never leaving out of consideration the proper finish of the filling to insure the best possible result and comfort.

While I have touched upon many phases concerning the deciduous teeth without going into minute detail, I would not pass to a summary of their importance without a few words regarding "extraction, an operation demanding the utmost judgment, on account of the anatomy of these teeth and pain caused in their removal."

Unless they are very loose, and there is absolutely a certainty that the operation can be done without pain, an anesthetic

should be administered to avoid this pain, also for the purpose of dispelling fear for subsequent operations.

Too long retention of the deciduous teeth, as we know, is the direct cause of many irregularities in the permanent set, but I am certain that premature loss of them either by extraction or accident is a greater cause for these irregularities, hence too great stress cannot be placed on this phase of these important teeth, and they should therefore be examined at regular periods, say at least three times a year, rendering them prophylactic, restoring lost structure when necessary, and advising extraction when occasion demands.

This prophylactic treatment, after thorough examination, consists of first removing all loose roots, etc., removal of such teeth as becomes necessary at the time; here I am compelled to repeat that frequent examination is necessary on account of the divergence of the time when these teeth egress. After this is done the teeth that are diseased are rendered in healthful condition and lost tooth structure restored. We now come to the cleaning of these teeth, another very important factor, consisting of first scaling the teeth thoroughly, removing all hard and soft accumulations around the teeth, not overlooking the occlusal surfaces where deposits accumulate in the sulci, sometimes disturbing the bite and interfering with mastication.

The cleansing of these teeth should be by means of the rubber cup and the use of Buffalo's pumice, and equal parts of calcium carbonate, the chalk modifying the coarseness of the pumice. The interdental spaces should be gone over by passing clean ligature on which is applied the cleaning material, between the spaces; small, narrow strips of rubber dam are sometimes used for this purpose, as in the permanent set. The gums should now be washed with a mild astringent antiseptic and followed with milk of magnesia or some other antiacid, and the child's mother or nurse instructed as to the proper home care, a factor which, if carried out properly, is also a consideration leading to the healthful economy of the child.

This smoothing or cleaning, whether it be the first or the last duty or operation, does not lose its importance.

The question oftentimes is asked why this effort, why all this attention to these temporary or primary organs, so soon to be

lost? Aside from the fact that upon the proper retention of these teeth to assist in maintaining the correct relation of the jaws and their natural development, the answers are manifold and imperative.

Considering first mastication, with its disastrous results upon the stomach, when improperly performed, and it is surely incorrect if the very organs that are meant to perform these duties are decayed, diseased and broken. The stomach of a child that should be continually strengthening and developing is instead weakening, performing far more than its natural function, resulting in gastritis, indigestion and the numerous other disordered conditions, to say nothing of the other organs thereby directly or indirectly affected that may result from same, causing a general derangement which can in most cases be improved only by correcting the cause; that is why the deciduous teeth become a factor in health and all that it means. Nor is that all—the toxic poisons from pus and pus-producing germs, such as we find in abscessed and pulpless teeth, are constantly taken into the stomach, finding lodgment in the already irritated folds, the dangers of which cannot be estimated—a depleted nervous and general physical condition.

This is true in the same conditions of the permanent teeth, and no one is disputing that it is so with the temporary set. It is a fact that in a very active child, much that may lead to deleterious effect is thrown off on account of the resistance in the stomach, which is very vascular in its construction, though in an inactive child the results are always manifest, robbing the child of many useful hours, much pleasure, strength and natural development, all vital issues in the child's comfort.

Much stress has been and is being put upon the kind and character of food children are to eat; in other words, teaching them what to eat; it would be better by far to teach them how to eat.

In the examination of children in schools much delinquency has been traced to defects in the nose, eyes, ears and other organs. I am sure that the teeth are direct or indirect contributing factors.

Regardless of what another may say on the subject, it is certain that the neglected conditions in the deciduous teeth are

not confined to any one caste or class, the rich, the poor, the high, the lowly, suffering alike all through the lack of attention on the part of parents, not appreciating their value. Nature provided these teeth for a definite purpose to assist in developing the jaws, to aid in mastication, to maintain facial expression, and they are a definite factor in speech.

Therefore, too great a stress cannot be placed upon the fact that parents must care for the mouths of children, and train them until they are able to attend to these duties themselves. Form the valuable habit of oral cleanliness, thereby that habit becomes the very nature of the child. *Habitus erit naturam.*

In the researches of Heitzmann, Bödecker, Abbot and others it is claimed that the primary teeth are in an advanced stage of development before birth and are not subject to the imperfections caused by diseases of childhood. In view of this it may be said that nature really equipped the child with teeth that would not decay under clean conditions; more so I believe than is the case with the permanent set. This theory is borne out by three distinct cases coming under my own observation. Three patients had remaining in the lower jaw the first deciduous molars. The patients were at the respective ages of twenty-two and twenty-six years. In each case every permanent tooth in the mouth was decayed, while the temporary molars remaining were found without a defect or discoloration. Therefore, it is reasonable to assume what proper care may accomplish in this regard.

Observation will show that where there is a general tendency to good health in the child, absorption of the roots will take place more perfectly than will be the case in patients that are affected by unhealthy conditions; that no doubt is due to the natural elimination of waste.

We also find that children with healthful oral conditions are not as likely to the frequent stomach disorders whether they be acute or chronic, because the stomach is doing its natural work. It might also be well to mention that in the study of school children, where there is a normally good set of teeth, nervous tendencies are in a great way lessened, and they, as a rule, get on in school work better, because they are usually possessed of perfect poise, unless, of course, there be other disorders, many of which cause serious handicaps.

Many improvements in this way can be brought about, and it goes without saying that the means are justifiable.

Our grandparents, in their lack of wisdom, dismissed the idea of anything but extraction of these primary teeth as a foolish notion. We have therefore but to observe the sign of the times, to note the gradual improvement and betterment along these lines. While not losing its importance, exodontia becomes the final and not the foremost consideration.

Withal, the neglected conditions found in the mouths of children are appalling and should not be condoned in any community. There need be no great discovery to eradicate these conditions. Education is the means by which we are called on to combat them. That they must be overcome is but an appeal to reason, the common sense efforts of parents, and the greatest power on earth—knowledge. Dentists have urged the correction of these conditions to parents to their utmost. In schools it is being advocated by instructor and by medical examiners, from the department of health and the like, while the family physician is doing his part in proper examination and advice. The remedy therefore lies particularly with parents who, though latent in their duties, are none the less commencing to appreciate the value of these matters, and know that upon care in youth depends in every respect the comfort in age.

Any time is a good time to form a good habit, though childhood affords the better opportunity. "If youth but would and age but could," as some one expressed it, may form a logical reason why neglected conditions in children become so serious a consideration.

"Shun delays! They breed remorse.

Lance the wound while young the sore:

Older sores ask deeper lancing."

The foregoing, though not meant as a direct philosophy of prevention, none the less will dispel those fears and grievances always incumbent upon dental operations, made more serious and painful by longer delays.

Then finally, it is well to sow the seeds of oral cleanliness in the very nature of the child, and that child becomes heir in part, at least, to the richest blessing—prevention. Putting into practical execution today the thought of yesterday is progress;

carrying with it the rule that the boy or girl of now is the man or woman of the future, with the responsibilities resting on them, we should equip them with the first requisite—health; that is why the intelligence of the entire world is directed to child-welfare or the material well-being of the child.

Though perhaps not intended for a subject of this character, I quote from James Russell Lowell:

“Get but the truth once uttered, and it is like a star, new born that drops into its place, and which once circling in its placid round, not all the tumult of the earth can shake.”

PROCEEDINGS OF SOCIETIES.

ILLINOIS STATE DENTAL SOCIETY, FIFTIETH ANNIVERSARY, MARCH, 1914.

DISCUSSION ON THE PAPERS OF DRS. NOYES AND BLAIR.

DR. GARRETT NEWKIRK, Pasadena, California:

Mr. President and Gentlemen: I have been so overwhelmed with memories of the last thirty-four years that I hardly know what to say.

More profitable to you, young men, than anything I could say, would be for you to take these papers after they are published and go over them carefully and impress their contents on your minds. More profitable than anything I could say would it be for you to take the transactions of this society and go through them, and in them find not only the history of the Society but practically the history of the progress of dentistry during the last fifty years. I was hoping that we should have a large audience of young men. They need most the words we have to say. Our lives are principally behind us; yours professionally are largely ahead. You are building; we *have* builded, somewhat indifferently perhaps, but better than we knew. He who builds at all, of good material in this life, always builds better than he knows; his influence is greater, more far-reaching than he can have any conception of. The more I see of life, the more I am convinced of that fact. In the few minutes at my disposal I wish to hold up to the young

men the character of those who have passed away and of some who still remain, the older members of the Society who have been its builders. You have heard of them. We who knew them appreciate them more than anyone else can. They stand before us; what for? We have heard today about their self-sacrificing devotion; We have heard about Dr. Cushing, who never missed a roll-call, nor adjournment, or anything of importance that was going on in any meeting. He never failed to contribute all he could to these meetings for forty or more years. What is better to aspire to for any young man than faithfulness and devotion to those things that are worth while? There was one thing you did not hear mentioned. Nobody asked, "How much money did they make?" Of no one was it asked, what his income was per year, what he charged for his services? In this connection I am reminded of a little story.

Dr. Bridge, formerly of Chicago, tells of an incident occurring at the Union League Club. A very wealthy man had died, who was not very popular. He was not noted for his generosity in giving to good causes. Someone asked the question, "How much did he leave?" A very precise, pleasant spoken gentleman, always noted for his accuracy of speech, and freedom from anything profane, said, "Well, I do not know how much he did leave, but it is my impression that he left every damn'd cent." (Laughter.) That is what he did.

The founders of this society left a legacy of intellectual and moral power, that will go on and on, forever.

Another thing young men should learn is, not to despise the day of small things. Remember when this Society started it was the day of small things. He that is faithful in the least shall be rewarded eventually in that which is much. The day of small things the older men have had to pass through. All young men must pass through it. Be faithful to every duty, to every good opportunity in your life, and the greater things will follow upon a sure foundation.

I heard a man who has been in practice twenty years say yesterday that, at first, he had a slow and hard time. It seemed other men were getting on faster than he, and he thought that if he adopted advertising methods he might advance and get money sooner. But, he said, "the thought came to me, what would

Dr. Johnson say?" (Applause.) Oh, it is a good thing to have a grand ideal—some character that you think of often, that is a monitor in times of temptation and trial. That is the hope of some of us older men, if we are worth anything—that we may be monitors to somebody.

I think so much about the old men who have passed away, I fancy even now that I see them sitting in a section by themselves—Cushing, Judd, Dean, and others of their type. I can see them as plainly as I can see you, and I say to myself, Is it possible that they are absent? That they do not know what is going on; that they cannot see and feel the things we are saying and doing? I cannot think they have simply dropped out of existence. Surely those grand souls are in some larger sphere. Mark Twain imagined himself traveling among the orbs of the universe seeing things to us invisible and inconceivable. Surely they somewhere have an existence still, and are bound to us by ties of knowledge and affection. They are still linked to us. I will close my speech with a little poem that I wrote a few weeks ago.

HAVE YOU THE SOUL OF A BIRD?

Have you the soul of a bird, my friend,
Loving the light of the sky;
With nesting thoughts in the leafy trees,
Where boughs are thick and high?
The soul of a darling bird that swings.
On a lithesome limb, and sings.

Have you the soul of a bird that flies,
From north to south afar,
Beyond the vision of human eyes,
By the light of sun or star?
Thro' liquid depths of the azure sea,
His wing-oars flashing, quick and free.

Have you a soul that longs to know
The secrets of all the years,
To fly through endless ways unknown,
By the light of a million spheres?
Like a bird set free, unbound
By the walls of sight and sound.

DR. C. N. JOHNSON, Chicago:

Mr. President: The hour is very late, and I am not going to detain this audience except to give in a brief way some of the impressions that have been made by those two splendid papers.

I have been impressed, as I am sure all of you have, with the men who made the history of this association, and I have also been impressed with its present status of which, I am sure, we are all very proud, but I do not believe there is a single member here who actually realizes the significance of the situation as it exists to-day. It will take some time to get away from this fiftieth anniversary meeting, to view in perspective the significance of this occasion, but with all of this the thing that has been most prominent in my mind today, strange to say, is not the past nor the present, but the future. I look with some concern upon the development of this organization in the future, not that I have any lack of faith in the splendid men who have charge of it today, nor in those who are to come; but I think there is a tremendous responsibility placed upon them in view of the record that has been made in the last fifty years, and I feel that if we are to maintain the pace set by the Illinois State Dental Society in the next fifty years that has gone on in the last fifty, we must re-double our efforts. We have been working hard in the past, but we must work harder in the future. I look upon any organization or any community or any nation in a most dangerous stage of its existence when it has reached the summit and there seems nothing more to do. We feel today, probably some of us, that we have reached the summit of perfection, so far as managing and carrying on a dental organization is concerned. The moment we allow that to become a conviction, this organization will go down and disintegrate, and that is an unthinkable thing so far as the Illinois State Dental Society is concerned. I want to leave the thought with the young men that they are accepting a heritage which places upon them the serious responsibility of carrying on for another fifty years the work of the men who have gone before and those who are here today; they will have to take up the work where it has been left off by others, and my fervent hope is that they may succeed in carrying it on to greater and greater perfection as the years go by.

DR. THOMAS L. GILMER, Chicago:

I have been both pleased and entertained by Dr. Noyes' and Blair's papers, and can subscribe to the truthfulness of their statements since my experience extends nearly, or quite as far back as any one's present.

I can without exaggeration say that I owe more to the Illinois State Dental Society for what success I may have achieved professionally, than to any other source.

When we look back and realize the great advantages some of us had from listening to and associating with such great teachers as Judd, Eames, Forbes, Spalding, Black, Cushing, Noyes and others, we cannot but feel that we were fortunate. The Illinois Society has from its inception, been a great post graduate school which disseminated knowledge free to all dentists who cared to imbibe it.

I can but regret that so few are present to learn of the men who were foremost in the early activities of our society.

DR. B. J. CIGRAND:

I just wish, Ladies and Gentlemen, to pay my tribute to the men who have guided this great organization. I joined the Society at the time we had a bi-state meeting with the Iowa State Dental, at Davenport and Rock Island. That was in 1893 and Drs. Swain and Noyes induced me to join, and I want to give this testimony: I believe the men who organized this Society, who guided it, who fathered it, and who protected it, have done more for humanity in this State than any other organization of men, unless it be the medical profession. They have done it unselfishly, and the question of price or remuneration has never entered.

But the thing I would rise for in particular is to speak of another anniversary which to my surprise has not been referred to. It is the fiftieth anniversary of the first appearance of a dental journal in Chicago. I looked up the matter last month, and I find that the first dental journal appeared in Chicago, fifty years ago at this time, and it was edited by Dr. W. W. Allport, and Dr. T. T. Creighton, and was known as the "*People's Dental Journal*," and it was edited and published absolutely in the interests of the people. It came out quarterly, and was supposed to be given to the patients in the dental offices of practitioners in this State, and in it are the most remarkable prophecies and the most remarkable state-

ments of what we heard today, and yesterday, and the day before, of anything I have ever read in dental literature. Dr. W. W. Allport makes the statement that in the ratio in which the Illinois State Dental Society and the *People's Dental Journal* serve humanity in that same ratio will its members be successful and will they be remembered. This dental magazine covered the widest possible range of dental education for the populace, and continued for several years.

Fifty years ago there was a hotel, known as the "Sauganash," a three-story wooden building, the primitive dental headquarters, with a wonderful history, located at the corner of Lake and Market Streets, only a few blocks from here. The visual progress from that pioneer hotel to the visual progress of this wonderful La Salle Hotel, is not to be compared to the educational and instrumental progress of Dentistry to which Dr. Newkirk and Dr. Johnson referred, all of which is the reward of faithful services, of Drs. Cushing, Black, Patrick, Swain, Noyes and Crouse. These and a score of others merit our gratitude.

I am glad to be here and say the men who were spoken of, these leaders, I have met, and have seen and heard, and I am glad to say they were the best friends and advisors of my dental career. Any man that belongs, for 20 years, to the Illinois State Dental Society and accepts its ethics, can look back and say, I am purer of mind, I am more willing of hand, and I am warmer of heart, because I joined in this great mission and knew these wonderful characters. (Applause.)

I wish to add that the publisher of that dental quarterly to which I have alluded, was Dr. L. P. Haskell, who is present, and I am sure the Society would be glad to hear from him.

DR. L. P. HASKELL:

The good Lord has spared my life of nearly 70 years of practice to witness this most remarkable gathering of dentists the world has ever seen. I do not believe it will ever be repeated. This great meeting is made possible because we are in harmony.

I have made the statement often to dentists from other sections, that the Chicago Dental Society, the largest local Society ever known, of more than 1,000 members, is made up of young, middle aged and some old men, wide awake, progressive, literary and in-

ventive men working in complete harmony, the like of which is nowhere else to be found. (Applause.)

There is one member of this Society stands upon the highest pinnacle of dental fame, of any dentist who ever lived. Dr. G. V. Black, a great investigator, inventor, and author upon all phases of dentistry. (Applause.)

There has been published by members of this Society eight of the most up to date text-books ever published.. Dr. Johnson on Operative Dentistry; Dr. Black's two large volumes on Operative Dentistry; Dr. Goslee's on Crown and Bridge Work; Dr. Case on Orthodontia; Dr. Buckley on Materia Medica; Dr. Fred Noyes on Histology; A History of Dentistry by Dr. Koch; Dr. Talbot has published 15 volumes along lines of original investigation and now Dr. Brophey is preparing what will undoubtedly be the greatest work on Oral Surgery.

DR. GARRETT NEWKIRK, Pasadena:

We have with us this morning one of the charter members of the State Society, one of the best men that ever lived, one of the best practitioners I ever knew, whose modesty has kept him in the background. I refer to Dr. A. E. Brown. (Applause.)

THE PRESIDENT:

I will ask Dr. Brown to say a few words.

DR. BROWN:

I have nothing to say, Mr. President, other than to wish you all God speed. (Applause.)

DR. J. G. REID, Chicago:

Dr. Brown was practically the first man I became acquainted with when I came to Chicago in 1873, and he looks as young as he was then.

DR. EDMUND NOYES (closing the discussion on his part):

There were great men in those early days. I wish to congratulate you and to express my admiration and the satisfaction that we all feel in the fact that we have a great number of young men at present, who, I am sure, will measure up to the standard of those men when they were young.

I want to relate one or two stories before I sit down. It so happened that Dr. Newkirk and Dr. J. Frank Mariner were riding across the state of Illinois in a train, and at one point Dr. Newkirk

pointed out of the window and said, "Mariner, in that house I attended my first patient when I began to practice medicine." Dr. Mariner gave due heed to the house, scanned it with appreciative attention, and then said, turning around to Dr. Newkirk, "Who lived there afterwards?" (Laughter.)

The other story is about Dr. Black and Dr. McKellops. At one time when Dr. Black was practicing in Jacksonville, Illinois, a lady came to him from some distance and established herself in Jacksonville while she could have the necessary work done in her mouth. There was a great deal to do. There were many items of work, and some that required long continued care and treatment, and after it was going on for about six weeks the lady said to Dr. Black one morning that she was getting tired of it; it was taking too much time and costing too much money, and she believed she would go to St. Louis and have the work finished. Dr. Black said to her, "Who do you think of going to in St. Louis?" She replied, "I thought of goin to Dr. McKellops." Dr. Black replied, "Whatever Dr. McKellops may do for you will be done well." She went down to St. Louis, got into Dr. McKellops chair, and he began to look into her mouth for a little while, shortly he drew back and said, "Who has been taking care of you?" And she replied, "Dr. Black in Jacksonville." She probably told Dr. McKellops why she had come down to St. Louis, but I cannot vouch for that. But the woman told Dr. Black about it afterwards and said, "He cursed me out of his chair; he cursed me while I was putting on my hat, he cursed me down the stairs and up the street as far as I could hear him." (Laughter.)

DR. D. M. CATTELL, Nashville:

Brothers and Friends: It is difficult for me to say anything after my friend Newkirk has hinted at things that I feel. I know that the spirits of those grand old men are listening to us. I feel it. Every man whose name was mentioned by Dr. Noyes in his paper was a personal acquaintance. They were more than that—they were my friends. I knew them all but one personally—Dr. Judd. The feeling I have is, that in all our meetings those noble spirits are with us, and it is this that has kept my mouth closed—they seemed to be talking.

Oh, the young men, where are they? They are not here.

They are the ones that should be the more interested in these beautiful orations by Drs. Noyes and Blair. I want to ask the readers of the two papers to forgive them, for "They know not what they do." (Applause.)

DR. BLAIR (closing the discussion):

I will ask to be excused from any extended remarks. I simply wish to say that I have been delighted with the discussion, and wish we could have remained for some evening session, with ample time to have heard all the older members. Down in my heart, after looking this matter over for a long time, I really feel there could be nothing more helpful to the organization than to look back fifty years, to have the young men observe the devotion to the society's welfare manifested by those who in the years gone by have been most active in its upbuilding. The future of the Illinois State Dental Society is in the hands of the new recruits. There is much that may be gleaned from its early history that will inspire loyalty to the society in the future. Proud of its first half century, let us hope for still greater progress hereafter, and with supreme confidence in the men at the helm await results.

PROCEEDINGS OF SOCIETIES.

CHICAGO DENTAL SOCIETY.

A regular meeting of the Chicago Dental Society was held on Tuesday evening, April 21, 1914, at 8 P. M. in the University Building, 31 West Lake Street.

Dr. George N. West, President of the Society, occupied the Chair.

Dr. F. B. Noyes presented a paper on "The Structure of the Peridental Membrane and Some Experiments on Repair of Injuries to It."

DISCUSSION.

DR. H. A. POTTS:

Mr. President and Gentlemen: As Dr. Noyes has said, this demonstration should not be taken as at all conclusive. This series of experiments opens a wide field for study and demonstration, and will, no doubt, clear up many points in therapeutics

as well as some of our ideas in regard to regeneration. From the biological standpoint we argue from analogy that the most highly specialized organs are those in which repair takes place the least readily, or really that repair is impossible or very slow in those organs. The slides seem to point, I think, to a possible regeneration of the fibers of the peridental membrane under certain conditions. We must realize too, that these slides are of perfectly normal tissues, which are not human. We are subjected to some criticism, probably rightly, in assuming that the tissues of the lower animals react in identically the same manner as tissues of the human, as conditions are not the same. These slides, as you have seen, have shown granulation tissue. All wounds heal by granulation tissue, the size of the scar depending upon the amount. If the edges of the wound are perfectly coapted and without infection we say it heals without a visible scar formation, or by first intention, and this smallest amount of granulation tissue we seek to bring to our assistance in the closure of wounds. The presence of pus in a wound has been taken to mean an infection. We do have pus in infections, but we all know that we may have pus from an injection of irritants, in fact, some of the older surgeons, when they were not favored with what was known as laudable pus, sought to bring that condition about by the injection of irritants. There is a distinction, I think, in our conception of pus, at least it may be taken as bordering on the physiological and the pathological. I think the general opinion of pus is that it carries with it the idea of destroyed tissue, but the serious results follow the decomposition of pus. Now granulation tissue is but the forerunner of scar tissue, and we know that the repair tissue is not as strong as the original tissue. In arterio-sclerosis where we have the sclerotic process as a consequence of degeneration, the effort of nature is to strengthen the wall in order that the blood vessel may still accommodate the normal blood pressure which may be thrown upon it and not suffer dilatation, or aneurism.

Now, as to the fibrous tissue, further experimentation will demonstrate as to whether this newly formed fibrous tissue is really a continuation or rejuvenation of the already existing highly specialized fibres of the peridental membrane, or whether it is ordinary scar tissue. Whether the fibro-blasts of these

specimens are from the original fibro-blasts of the peridental membrane will be an interesting study. This series of experiments will be along the line of clearing up not only the question of repair, but also our application of therapeutic measures. It was shown very distinctly that in the first injury without any medication that probably within twenty-four hours the epithelium had entirely closed over the wound. I am not familiar with the bacteriology of the mouths of animals and do not know the part it plays in such conditions, but here we have an injury and the microscope shows very little reaction to the injury. This brings in the question of the amount of inflammation relative to repair. We must have more blood to the part. The blood vessels are dilated. There are round cells and leucocytes deposited in the tissue which have escaped from fixed blood vessels. There is a development of new blood vessels, and all this goes on simultaneously. Now a certain amount of irritation seems to be necessary for repair, but if carried to too great an extent it becomes burdensome. The tissues suffer for it. That can be demonstrated on the slides of those tissues which were irritated by medicines.

Take our infected granulomata, there is a large amount of round-cell inflammation around those chronic areas. Then in the healing of wounds you all know how stubborn a varicose ulcer is. It will not heal. It needs stimulation, but a wound in healthy tissue does not. The drugs were designed to produce irritation and not to disinfect the cavity, although a disinfectant is but an irritant, something that is poisonous to the organism, and in a lesser degree poisonous to the tissues in which it lies. You can only sterilize on the surface of living tissue. We know that micro-organisms are carried to a great depth, and we have all seen infections from alveolar abscesses jump over a space and land in a lymph gland in the center of the cheek. Now all this seems to me to point to too much therapeutics. After the demonstration by Pasteur of the cause of fermentation it was discovered that these micro-organisms were the cause of pus formation. That was not the original intention. The experiments which were carried on under the strong antiseptic phenol, which was sprayed not only on the wound but on the operator and in the room, did, to their astonishment, prevent the forma-

tion of pus. That was all well and good, but the wound did not heal, consequently other milder antiseptics were used in the same manner, and so it was finally graded down until antiseptics were used which were the most mild and still poisonous to the various organisms. Surgeons went through that stage. They have now come to the stage of asepsis rather than antiseptics, and all we do is to operate aseptically on as aseptic a field as possible under aseptic conditions.

Experiments along the lines here started I think will bear out our experience in the use of antiseptics in the treatment of aseptic wounds. Aseptic wounds do better under a salt solution rather than antiseptics and the continual touching up of recent wounds with the various antiseptics seems to prolong rather than hasten the process and the slides here shown indicate that the greater amount of granulation tissue that is produced means more scar tissue, longer time of reorganization and a greater degree of contraction.

It will certainly be very interesting at a future time to hear of Dr. Noyes' efforts along this line.

We see the effects of irritation upon the absorption, which is a physiological, also a pathological condition, and strange to relate, this absorption took place beyond the line of greatest injury. You saw the surface of the tooth was hollowed out by the osteoclasts in cutting away the cementum of those parts, and that in time this would possibly show a rebuilding of bone into these hollowed out places, although the manner in which these teeth are held in place is thought to be mechanical by close adaptation of scar tissue. It seems that so many of these problems belong to one and the same process except in degree. Pain itself is but cerebral cognizance, dependent on the intensity of the irritation. The process of cell growth itself is inherent in the cell, and we know that we have pathological growth from irritation. The simple red color will produce intense cell growth by irritation. Place red salve on the skin, leave it a week and the skin will be proliferated in almost hair like proportions. It is an individual question of judgment as to how much irritation should be brought to bear in various cases.

DR. V. H. MOON:

Mr. President, there is nothing that I can add to what Dr.

Noyes has given us in explanation and interpretation of results attained. The results are very indicative of what we may expect in the healing of simple injuries of the tooth and the peridental membrane, and to base any more conclusions on these might be to go beyond what we can safely do, but I can certainly heartily endorse the conclusions that Dr. Noyes has drawn as indicating what may be expected in the repair of the peridental membrane, and that the same processes go on in that tissue as will go on in other parts of the human organism, and we may expect that the same results will be obtained in the human that obtain in the lower animals. These animals are so closely related to us we find that when a certain process goes forward in the animal we have reason in our biologic studies to conclude that the same process will occur in the human.

Dr. Noyes has drawn logical conclusions from the work as far as it has gone, and further than that the conclusions will have to be deferred until we have the microscope and gross evidence of something on which to discuss the conclusions.

DR. F. B. NOYES (closing the discussion):

In this work Dr. Moorehead did most of the operating and Dr. Moon has done practically all the technical work.

Now in regard to one or two things in connection with this matter. The first thing I want to say is that I think the dental profession does not begin to realize that in the condition in which they find the peridental membrane detached from the surface of the cementum by pathological process, the tissue is entirely different from the normal tissue. It has been the result of acute or chronic inflammatory processes which have entirely changed the histologic picture in that piece of tissue. For instance, in chronic inflammation, pyorrhea condition of the gum all of these fibers that you have seen are gone. They are not there. If they are not there how can you attach them to anything. The question of re-attachment is no question at all. There is nothing of a normal character to the tissue. Until it returns to a normal character the idea of attachment is out of the question.

That is an important difference between this series of experiments and the conditions that obtain in practical work. We have no pathologic changes in the histologic elements of the

tissue. We simply go in there and tear up a lot of normal tissue. Of course it was the intention to keep one of these dogs until the changes had gone through to their completion. Until that is carried out it is a waste of time to guess what that is going to be. The oldest of these experiments was a trifle over three weeks where it was intended to cover three months, and probably ought to be longer than that.

I have a few slides of the human tissue showing what has occurred in these chronic inflammations, the displacement of the fibrous tissue by what is practically granulation tissue which has no structural characteristics at all. That involves not only the fibrous tissue at the margin of the gum, but involves the periodontal membrane of the bone and destruction of both, and before you begin to recognize the gingival inflammations that are the beginnings of pyorrhea the histological action has extended into the bone of the alveolar process.

One practical idea has been suggested by some things that have been said. The treatment of all these pathological conditions must be studied as a biological problem, and it seems to me that we have to consider the use of such drugs as antiseptics in pockets and wounds not as germ killers but in their action on the surrounding tissue. The only things that will take care of the germs is what nature takes care of them with. The value of the agent that has been used as an antiseptic is as a tissue stimulant in throwing out those cells into the air that will take care of the germs rather than the killing of the germs by the agent used. The consideration must be a biological consideration, the effect of the drug on the living cells. That depends entirely on the condition. In certain conditions we may have a considerable area of tissue in which the cells are still alive, but still they have been under the influence of poisons to such an extent that they have little vitality. They do not respond. They have no energy, and are paralyzed by the conditions which surround them. We may wish to destroy a whole area of tissue of that kind to get back into tissue that will react, and then again we may want to stimulate the cells forming the boundary of the walls. I hope we will be able in our next experiments to carry at least one dog through to completion.

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science,

PUBLISHED MONTHLY.

EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

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EDITORIAL.

A PLEA FOR DIAGNOSIS.

One of the most pressing needs in the dental profession today is a better diagnostic sense on the part of its members. It is all well enough to be able to perform beautiful technical operations, to insert permanent fillings, and do artistic bridge work. It is of course a fine thing to carve occlusal outlines on a porcelain crown or to reproduce anatomical forms in inlay work. These things are necessary in order to do the highest class of service to the people, and no dentist should rest content till he is qualified to do them.

And yet there is one thing even more important than all this, and it is a thing too frequently overlooked or ignored—and that is the ability to accurately diagnose the various conditions which are daily presented to the dentist for solution. There is altogether too much guess-work, and in many instances too great a degree of indifference, when it comes to diagnosing morbid conditions of the mouth. Many a patient is allowed to go on suffering unnecessarily through failure of the dentist to seek out the cause of the trouble. It is not here claimed that it is always easy or even possible to diagnose the difficulty at once. Some of these conditions are exceedingly vague and elusive, but this very fact should act as an incentive to develop a keenness of observation on the part of the dentist to meet the emergencies as they present. It would sometimes seem as if there was such a thing as the *diagnostic sense*. Some men seem to be able to detect the cause of pain for instance with an unerring instinct

where others grope blindly in the dark. And yet it will usually be found that the man who excels in diagnosis is the one who has applied himself most assiduously to the study of the phenomena of symptoms, and who has long been a close observer. The young practitioner cannot be expected to diagnose obscure maladies as accurately as the experienced man but every young graduate should make this question of diagnosis a serious study and look upon it as one of the most important functions of his practice, to the end that he acquires early in his career an acuteness of observation which will eventually make him master of every situation.

The importance of diagnosis is not sufficiently emphasized in the college curriculum, and even when it is emphasized the average student seems to lean more toward the technical than to this. The thing that appeals to him is the tangible filling or crown—the glitter of polished metal or fused porcelain. It never enters his mind that the greatest thing in dental practice is to find the trouble when a patient is suffering tortures from some obscure cause, and to relieve this suffering and see the change on that countenance from misery to happiness. There is nothing in all professional life like this—nothing to compare in service with the ability to detect disease in its early stages and to arrest it before it has wrecked the life of the patient.

This is really a thing which has too long been neglected by the profession, and the present plea is for dentists to study more carefully the symptoms and manifestations of disease in the mouth so that better service may be rendered the public.

THE EDITOR'S DESK.

MY PLEDGE.

First I pledge myself not to continue to think ill of any man. That I shall at times and on the impulse think ill of people is only an evidence of my own frailty, and this I pledge myself to overcome in so far as I recognize it, and as soon as I recognize it.

I pledge myself to help the unfortunate to help themselves, but I shall not add to their misfortune by assuming a burden which properly belongs to them. If perchance I am stronger than others I shall not vaunt my strength by a vulgar display

of paternalism over them. If I am weaker than others then shall I not cringe at their feet by permitting them to accept a responsibility which is mine.

I pledge myself to independence and self reliance except where the fact of leaning on others is for their needed development. I accept my own destiny without fear or favor.

I pledge myself to tolerance, except that I must not tolerate anything in myself which is low or mean or which I should not wish the world to see.

I pledge myself not to offend others unless by thus offending I may show them a real fault and affect a real remedy. I shall criticize no man for the sake of criticism but I shall not withhold criticism where it will do good—the only condition being that I must first be sure that it will do good.

I pledge myself not to judge any man by external evidence, not failing to remember that there is little evidence which is not external.

I pledge myself to try to do some good deed each day whereby my fellowman may be made happier, and I make this pledge realizing the exceeding great difficulty of fulfilling it owing to the rapid succession of days and the natural laxity of human nature—my own in particular.

I pledge myself to think good thoughts in so far as I can control my thinking, not forgetting that I must change my thinking frequently to keep this pledge.

I pledge myself to look on all sides of every question which may come up for my consideration, studiously avoiding the practice all too common of seeing only one side of a question—the one which is to one's own individual advantage.

I pledge myself above all things not to make myself a burden to others by magnifying my misfortunes or by constantly complaining at fate. The ills I have I shall strive to bear patiently, and seek to hide them from the world.

I pledge myself to live a clean life, not merely upright in the eyes of the law but fulfilling as nearly as I may the essence of right living as embodied in love, charity and justice.

And I make no further pledge, conscious of the fact that my natural limitations will make it sufficiently difficult to live up to these.

BOOK REVIEWS.

THE SCIENCE AND PRACTICE OF DENTAL SURGERY. Edited by Norman G. Bennett, M. A., M. B., B. C. (Can tab), L. D. S., (England). Dental Surgeon to St. George's Hospital and the Royal Dental Hospital, London; member of the Board of Examiners in Dental Surgery, Royal College of Surgeons of England. With an appendix on DENTAL JURISPRUDENCE by P. B. Henderson, B. A., (Oxon.) Solicitor of the Supreme Court. With 993 illustrations. Pages 797. Price in muslin \$9.00 net; in half-morocco \$10.00 net. Published by William Wood and Company, New York.

This is one of the most pretentious volumes which has come to the editor's table for many a day. The mere mention of the number of pages and the illustrations would indicate a book of some parts, but this does not tell the whole story. When it is considered that there are more than thirty contributors, and all men of ability in their various lines, it can readily be understood that the book is an important contribution to our literature. The subject matter is as varied as is the list of contributors, with 51 chapters besides the appendix, embracing every conceivable subject in the dental curriculum. Manifestly, within the confines of a magazine review, it is impossible to do justice to a volume of this character or to give anything of a detailed description of its contents. The first thing about it that strikes the individual who has had anything to do with the making of books is the prodigious amount of work necessary to bring out such a volume. To place before the profession so comprehensive a work as this is to achieve something notable, and the distinguished editor and his contributors are to be congratulated. The book is well worth the price asked and it should be in every dental library.

PRACTICAL HINTS.

Edited by J. E. Schaefer, D. D. S.

(This department is for busy readers. We want short articles containing practical hints—the shorter the better. No article must exceed 200 words, unless of exceptional merit. Every dentist has some useful hint that has been of value to him, and if he will only put it in print it may be of equal value to others. That is what this department is for. Due credit will be given for every article sent. Address J. E. Schaefer, 1745 W. Harrison St., Chicago, Ill.)

Causes of Root Canal Trouble:—Much of the trouble in root canal operations comes from either not having the technique standardized, being too hurried or using weakened instruments.—*Elmer S. Best, D. D. S., Minneapolis, Minn.*

Root Canal Instruments:—Instruments in root canal work require more careful attention than any other instruments. If they are intended to cut see that they are kept sharpened. If a spiral drill becomes weakened by turning on itself discard it.—*Elmer S. Best, D. D. S., Minneapolis, Minn.*

New Material for Casts:—Dr. J. H. Prothero has suggested that commercial calcined magnesium oxid (MgO .) mixed with a saturated solution of magnesium chlorid ($MgCl_2$), well spatulated and to as thick a consistency as may be used, and then allowed from 12 to 24 hours to harden will produce a model or cast, which is almost as hard as flint, and practically indestructible.—*H. J. G.*

Clean Impression Trays:—Clean trays and dip them into a pan of hot wax; then hang them up to dry. This will give the trays a thin coating of wax. Take impression in the usual manner and remove plaster from the tray by heating it over flame. Dip tray in wax solution again and hang it in place for future use. This will insure bright, clean looking impression trays.—*E. Eustice, D. D. S., Chicago, Ill.*

Indications for Sedative:—It is generally with skepticism that one tries a new sedative in preparing nervous or excitable pa-

tients for analgesia or for prolonged dental operations. Bromural, however, has proven so efficacious in the above conditions that I think it deserves mention more frequently. One or two tablets dissolved in water and given to a very nervous or excitable patient one-half hour before dental treatment will bring about a state of quiet and complacency that is good to behold.—*H. H. Hancock, D. D. S., Bloomington, Wisconsin.*

Shell Crowns for Broken Down Roots:—In this class of cases where there has been extensive destruction of the root, either from caries or accidents, and a shell crown is indicated, the first procedure is to pack the gum away with gutta percha, so that the cavity margins are clearly exposed. Then a gold inlay should be made to restore the continuity of the root.

Another class of case where the gold inlay and shell crown go nicely together is where there has been considerable recession of the soft tissues exposing the two buccal roots, of a molar for instance. A gold inlay inserted in the buccal surface of these roots obviates the almost impossible task of festooning a band to the outline of the gums on these exposed roots.—*Crown Clinic, Ill. State Soc.*

Method for Mounting Small Cervical Inlays:—The adoption of the gold inlay for the filling of small cervical cavities relieves the unpleasant and some times painful adjustment of the rubber dam, and the convenient and proper seating of the inlay may be enhanced by the use of the following method.

Cavity is prepared as usual. Sprue wire about the size of a common pin is heated and attached to wax pattern while in the cavity and wax withdrawn with this sprue. After casting cut button off leaving an extension on inlay which is to be used as a handle. With knife-edged stone grind this handle close to the inlay nearly in two, or so that it will bend easily. By the use of this handle the inlay may be easily mounted. After cement has hardened break off handle and polish inlay.—*G. M. Foster, D. D. S., Beach, N. D.*

Proper Gauge of Aluminum:—For a number of years past, I have used and recommended nothing lighter than 18 gauge. Plate

of this gauge is $2\frac{1}{2}$ times thicker than 26 gauge and therefore affords better opportunity for securing anchorage for the vulcanite. It is much more rigid than the lighter gauge and yet it can be adapted to the die with comparative ease. When grooved deeply along the line where the lingual margin of the vulcanite terminates, and that edge of the groove nearest the border crest is cut away, a well defined shoulder is formed against which to finish the vulcanite so that there is little or no tendency for the margins of the latter to curl up or break. The spurs can be made long and heavy and when opposed to each other as they will be when the graver is applied from opposite directions, ample anchorage is afforded the vulcanite.—*J. H. Prothero, D. D. S., Chicago, Ill.*

Casting Aluminum:—Aluminum is a most peculiar and refractory metal, with warpage or shrinkage, which is, of course, due to the readjustment or rearrangement of the molecules during and after crystallization, is probably to be diminished or overcome only by alloying or by the use of a very high grade of investment material.

With any of the investment materials now used for this purpose, it does not seem to matter how rapidly or how slowly the case is cooled after the casting is made; whether it is plunged into cold water immediately after crystallizing, or allowed to stand until thoroughly cold, or even for a day or so afterward, it will be noted that as soon as the case is removed from the investment and the resistance offered thereby is released, the molecules will at once rearrange and readjust themselves, which is to be observed by holding the casting close to the ear and noting the musical sounds which are easily discernible.—*Hart J. Goslee, Chicago.*

Banded Splints for Fractures:—Fit bands on at least two teeth on each side of the fracture, omitting the tooth or teeth involved in the break if possible; e. g., if the fracture should occur between the first and second bicuspid, place bands on the first and second molars and on the cuspid and lateral incisors. For this purpose, the usual regulating band material made of German silver may be employed. Pinch the band material around the teeth selected, burnish to fit the tooth, remove and solder. Place bands on the teeth and take an impression in plaster if possible. Run

model, using a material which will stand the heat of soldering. When the model is made, with the bands in position, fit and solder a rigid metal bar on the lingual surface, and one on the buccal or labial surface. These bars should be molded so as to fit in between the teeth as far as possible, else they will interfere with the tongue and cheek. The bands should also be soldered together at points where they come in contact.

The appliance should be carefully finished and polished, and may be plated if desired. The appliance should be carefully fitted to the teeth, and, if satisfactory, cemented in place.—*F. B. Moorehead, M. D., D. D. S., Chicago, Ill.*

MEMORANDA.

[Society notices will be given insertion in this department free of charge. Subsequent insertions will be charged for at the rate of \$2.00 an inch.]

INDIANA STATE BOARD OF DENTAL EXAMINERS.

The next meeting of the Indiana State Board of Dental Examiners will be held at the State House, Indianapolis, commencing Monday, November 16, and continuing five days. For application blank and full particulars address Dr. Fred J. Prow, Secretary, Bloomington, Indiana.

NORTHERN ILLINOIS DENTAL SOCIETY.

Ships fail to attack squadron and sailing found smooth on the way to Elgin, where one of the largest and best meetings in the history of the Northern Illinois Dental Society will be held the third Wednesday and Thursday, October 21 and 22, 1914. We are a small society, with small dues, small expenses, full of brotherly love. We meet on the plumb and part on the square. Don't forget the ladies' special provision. If you are sure of your canals, just have a skiagraph made. If you don't believe in analgesia, just listen to that convincing paper. Prophylaxis never grows old. Don't get confused in infection and defection, nor the date of our little meeting. Cross your dates. Do it now. F. H. Bowers, Secretary, Freeport, Ill.

THE DENTISTS' MUTUAL PROTECTIVE ALLIANCE.

The recent decision by Judge Kenesaw Landis in the Northern District of Illinois, denying the motion of attorneys for Taggart for a preliminary injunction against the officers and members of the Dentists' Mutual Protective Alliance marks the first skirmish in a new battle. The above is an organization recently formed in the State of Illinois for the purpose of testing the validity of all process patents relating to dentistry and though only four weeks old it boasts of a membership of over 400. Those who follow the progress of the Taggart process litigation will recall that in the Taggart vs. Boynton case the District Court of Appeals in Washington decided unanimously against the validity of the patent. However, in the case of Taggart vs. Moll, Judge Landis of the Ninth Federal District decided in favor of Taggart, thereby re-establishing the validity of the patent. In the face of these two conflicting decisions there is much speculation as to the results and the case will, therefore, be watched with keen interest by all members of the profession. Dr. J. Clinton Grant, Corresponding Secretary, 1118 Republic Building, Chicago Ill.

DENTAL COLLEGE COMMENCEMENTS.

UNIVERSITY OF TENNESSEE, COLLEGE OF DENTISTRY.

Graduates—W. P. Carter, T. B. Davis, N. L. Dennis, C. E. Dillard, A. E. Green, T. R. Ogden, L. H. Pittman, V. A. Puble, R. Terral, O. K. Weaver.

BIRMINGHAM DENTAL COLLEGE.

Graduates—L. Alexander, C. C. Cox, R. H. Cross, M. G. Dabney, W. S. Drummon, J. T. Endsley, J. J. Hadley, A. L. Helden, L. L. Lowery, W. A. Massey, G. C. Niles, M. G. Peck, W. C. Whatley.

LOUISVILLE COLLEGE OF DENTISTRY.

Graduates—J. C. Acker, J. M. Bentley, E. A. Bollinger, H. D. Clark, B. W. Crabb, W. C. Epling, J. E. Goodwin, Henry Lee Grant, C. E. Keller, D. C. Lilly, H. O. Limeburger, C. Lockhart, W. Mann, E. L. Martin, W. B. McMahon, J. S. McWilliams, T. I. Mossbarger, K. Prewitt, J. H. Pryor, W. D. Sanders, J. C. Schmidt, J. C. Scruggs, P. Sloan, H. E. Summers, B. N. Taylor, L. Tileston, P. Waltrip, A. W. Whaley, J. F. Wright, R. Ybern, H. M. Zoeller, H. A. Torregrosa.

COLLEGE OF PHYSICIANS AND SURGEONS OF SAN FRANCISCO, DENTAL DEPT.

Graduates—E. Barbour, W. O. D'A. Brewer, F. A. Dietz, K. I. Decker, D. I. Edwards, H. S. Embree, J. Fortgang, J. Galeoto, R. F. Gilbride, P. S. Haley, P. H. Hanschen, J. R. Howard, G. C. Johnson, M. V. Kimlau, G. C. Kleaver, M. S. Kneass, M. Kobovashi, H. J. Koencke, G. W. Leek, Jr., R. B. Lovell, F. L. Meagher, E. W. Nathan, C. E. Nixon, B. S. Nutter, J. A. Richert, H. O. Shoemaker, J. O. Shoemaker, J. A. Stamer, W. T. Tabb, G. L. Torassa, T. Yatwa, H. Yoshida, J. T. Yee.

COLLEGE OF DENTISTRY, UNIVERSITY OF SOUTHERN CALIFORNIA.

Graduates—L. W. Ayres, S. H. Baba, J. P. Black, E. R. Brownson, H. E. Cannon, R. M. Champion, E. P. Dennis, C. V. Doty, G. Q. Farwell, G. W. Henry, H. C. Humes, K. Iwata, Y. Kikuchi, F. C. Kloeppel, R. Knight, E. F. Lee, C. R. Lusby, W. H. McCabe, J. T. Parker, Jr., A. C. Prather, C. P. Ratliff, A. F. Roberts, G. H. Schildwachter, P. P. Sewell, H. C. Smith, W. J. Spencer, F. G. Staley, F. G. Stone, V. A. K. Tashjian, W. G. Tedford, E. F. Tholen, M.D., F. W. Tuttle, J. G. Washburn, R. L. Watson, C. B. Worthy, F. R. Yoshida, R. L. Young.

ST. LOUIS DENTAL COLLEGE.

Graduates—J. F. Ailworth, P. Brunzel, A. A. Caplin, I. B. Dunhaupt, A. C. Engel, J. B. McCafferty, C. C. Pearce, A. F. Searle, C. L. Behrens, J. J. Burke, J. J. Burns, E. H. Barsache, W. W. Cecil, L. W. Cohlmeier, F. W. Dains, M. C. Daniels, J. W. Deaton, R. Ferguson, R. W. Fisher, F. T. Grice, W. R. Hart, N. A. Harper, W. G. Hart, S. W. Heublein, J. M. Hogan, J. L. Johansen, T. Kanary, H. W. Lane, W. C. Link, W. E. Lockwood, J. Marberry, C. Marberry, R. A. Marshall, R. M. May, E. F. Miksicek, L. H. Moore, J. J. Orlick, J. R. Raney, A. K. Ratcliff, R. R. Rehm, G. F. Schroeder, C. E. Seten, W. I. Setzekorn, C. R. Storer, G. M. Trafton, P. Trigg, C. F. Walther, F. H. Washburn, E. H. Ziska.

THE DENTAL REVIEW.

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CHICAGO, OCTOBER, 1914.

No. 10

REPORT OF THE PUBLIC SERVICE COMMISSION.*

BY J. F. F. WALTZ, D. D. S., CHAIRMAN, DECATUR, ILLINOIS.

The present Public Service Commission was appointed with the understanding the plan of work for the previous two years should be continued and as many public meetings provided for as possible. This plan will be found outlined in detail in the commission's reports for 1912 and 1913 in the Transactions for those years. Accordingly in September, 1913, each component society was sent a communication requesting such society to co-operate with the commission in arranging a public meeting in one or more cities of that particular district and also that wherever possible the film "Toothache" be shown. Responses were promptly received indicating willingness to aid in bringing about such result and in some instances a request was received asking that a public lecture be given in a city where one had been previously given. Lack of initiative was found on the part of a few districts where public meetings might be held, but again the commission was compelled to ask that several proposed meetings be delayed until after the present jubilee meeting because lecturers desired were so engaged that this additional work could not be undertaken.

The plan of having each component society addressed by a local physician upon the subject, "The influence that diseased conditions of the mouth, nose and throat have upon the individual's welfare and a consideration of their relation to the community's health," as originally planned by the commission was thought to have been sufficiently well carried out over the state in the two previous years' work. Also the post-graduate course questions as compiled for last year's work were continued again for the present year as covering the ground sufficiently.

*Read before the Illinois State Dental Society, March, 1914.

Public meetings were held over the state as follows:

Mattoon with Dr. George E. Hunt as lecturer, attendance....	300
Danville with Dr. George E. Hunt as lecturer, attendance.....	600
Monmouth with Dr. J. P. Buckley as lecturer, attendance....	1,000
Robinson with Dr. J. P. Buckley as lecturer, attendance.....	1,400
Bloomington with Dr. J. P. Buckley as lecturer, attendance...	1,300
Anna with Dr. D. M. Gallie as lecturer, attendance.....	500
Decatur with Dr. C. N. Johnson as lecturer, attendance.....	1,300

Total attendance	6,400
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In compliance with the recommendation made by the commission in last year's report a second film was purchased in February, 1914, for \$150 from the National Mouth Hygiene Association and placed in charge of G. E. Hawkins as custodian and for use exclusively in Chicago and immediate vicinity. Through Dr. Hawkins' efforts this film was shown to audiences totaling 9,700 persons. The film purchased in 1913 was again in charge of H. F. Lotz as custodian and through him was shown as follows:

In Galesburg to audiences totaling.....	2,000
In Monmouth to audiences totaling.....	1,500
In Rockford to audiences totaling.....	3,000
In Springfield to audiences totaling.....	3,500
In Paxton to audiences totaling.....	400
In Danville to audiences totaling.....	3,000
In Bloomington to audiences totaling.....	1,500
In Freeport to audiences totaling.....	1,800
In Anna to audiences totaling.....	500
In Decatur to audiences totaling.....	5,500

To audiences out state totaling.....	22,700
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Grand total in Chicago and out state.....	32,400
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To summarize further, during the past three years public lecturers have been heard in 27 cities over the state by 23,600 and the film has been shown in 26 cities to 56,400, making a grand total of 80,000 persons whom the commission's work has reached through these agencies alone. This is exclusive of the public lecture given by Dr. C. N. Johnson in Peoria with the film during the 1913 annual meeting of the society with an attendance of 1,500.

From this report it will be seen much has been accomplished

and if to this is added the liberal newspaper accounts given of the lectures wherever held, the commission's efforts at publicity for its theme since its creation have been indeed gratifying. At the lecture in Decatur all the public schools were dismissed by their superintendent's direction in order that every teacher in the city might be able to attend. Much newspaper publicity was given the subject previous to and after the meeting and each of 6,200 school children was provided with a dodger setting forth the purpose of the lecture and these were taken home to the parents after being commented upon to more or less extent by the teacher. All members of the local medical society were guests at dinner with the local dentists and were afterwards addressed by the lecturer, Dr. C. N. Johnson. Newspaper men, school men and the Board of Education, the mayor of the city and certain citizens were present. 400 letters calling attention to the lecture were mailed to parties whom it was thought desirable to reach. Mothers' Clubs, clergymen and other organizations were also sent these letters. In this or a similar manner a publicity has been gained in connection with most public meetings which is far greater than the figures given would of themselves indicate.

The commission believes the work should be continued along these lines indefinitely or until a proper public opinion will have been formed and school inspection and instruction have been made general over the state. In no case have the lectures been given under the auspices of the local dental society but always under other organizations and preferably under the school authorities who are alive to the question and have almost without exception enthusiastically assisted in making the meetings successful.

The total expense incurred by the commission in its work for the past year has been \$255.89 inclusive of the purchase price of the new film. Revenue during this period from the films has been \$54.75 which leaves the actual total expense paid out of the society's funds \$201.14.

Respectfully submitted,

H. F. LOTZ,

G. E. HAWKINS,

F. B. MOOREHEAD,

C. M. SMITH,

J. F. F. WALTZ, Chairman.

REPORT OF THE LEGISLATION COMMITTEE.*

BY DR. C. R. E. KOCH, D. D. S., CHAIRMAN, CHICAGO.

To the Illinois State Dental Society.

Mr. President: At this period of the Society's history, your Committee on Legislation desires to call the particular attention of the Society to the fact that the very excellent law governing the practice of dentistry in this state is the result of the altruistic thought of a few of its earlier members, and the continuous struggle of all of the membership of this Society from its beginning to the present time.

We believe that as a result of the efforts of this Society in this direction, dentistry has attained a higher position within the limits of our state, and that our people are the beneficiaries of more intelligent, better educated and more effective dental services.

But not only did the Society labor with its reason and its influence upon legislators, but it also gave from its substance, and from the substance of its members, very liberally, during more than forty years, for the expenses involved in securing the passage of the laws, for the sustaining of the various Boards that have been appointed under them, for the assistance of the Board in prosecutions of offenders against the Dental law, and for the defense of the Board itself when assailed for the performance of its lawful duties.

Since the enactment of the first law regulating the practice of dentistry in this state in 1881, not a penny has been contributed by the people of the state in its support. In fact, it was the original unwritten agreement that such a law should become self-sustaining. About three years ago the state of Illinois, when making new regulations with reference to the fees of Boards and officers, compelled all the moneys received by the Board of Dental Examiners for its examinations, licenses, registrations, fines and forfeitures, to be paid into the state treasury; and made this fund available for the uses of the Board only so far as appropriations in the budget permitted.

We most respectfully desire to call the attention of this Society to the fact that in our opinion this arrangement is exceedingly unjust and unfair to the dental profession, because it does not permit

*Read before the Illinois State Dental Society, March, 1914.

all of the money to be used for the purposes for which it is authorized, by statute, to be collected. A budget may appropriate a certain portion for one purpose, and a certain portion for another purpose, but if in the experience and exigencies of the Board a larger amount is needed to carry on one part of its work, and a smaller amount for another, the Board is absolutely prohibited from paying its bills in the one department, although it may have an abundance of money available in another. In fact, the money being contributed by the dental profession for these purposes as originally designed, is not now being made entirely available for the uses for which it is being collected, in the language of the statute.

In making this statement we do not criticize, or find fault with any one, because this result undoubtedly is due to inexperience under this new method of administration, and we most respectfully suggest that so far as possible steps may be taken to insure the full use of the amounts paid in by the dental profession, for the support of the Board and for the prosecution of offenders against the Dental law.

Since making our last report a new Board has been appointed by the Governor. The members of this Board were chosen by the Governor upon his own initiative and without consultation with your Legislative Committee. In this the Governor has exercised his undoubted prerogative under the law. The members appointed, all of them, being entirely new to the duties of their offices, we believe are doing the best they can to faithfully discharge their duties to the state and to the profession, and we bespeak for them the support and confidence of the dental profession. We regret that Governor Dunne did not retain some of the older members of the Board until the new members could be thoroughly conversant with their duties, with the usages and precedents, and with the relation to other Boards and the national organization of Dental Boards; because we believe it would have been better for these new members and there would have been less of an interruption in the routine work of the Board.

We attach hereto copies of letters written the Governor on February 19th and March 18th, 1913, respectively.

Before closing this report we desire to acknowledge the most courteous treatment and consideration by the Governor in our personal interviews. He listened attentively to us, but made us no promises.

Your Committee is glad to be able to report to this Society that at the present time there are employed in the state charitable institutions nine dentists serving ten of these institutions, viz.:

Dr. Geo. A. Mills, at the Kankakee State Hospital.

Dr. M. S. Henson, at the Elgin State Hospital.

Dr. Wm. Babcock, at the Jacksonville State Hospital.

Dr. D. L. Woodworth, at the Anna State Hospital.

Dr. D. H. Baldwin, at the Peoria State Hospital.

Dr. T. J. Denny, at the Chicago State Hospital.

Dr. Waid Doty, at the Lincoln State School and Colony.

Dr. H. H. McCormick, at the Illinois Soldiers' Orphans Home at Normal.

Dr. A. M. Woolson, at the State Training School for Girls at Geneva, and at St. Charles School for Boys at St. Charles.

All of these excepting Doctors Baldwin and McCormick, give their entire time to the service of these wards of the state.

All of which is very respectfully submitted.

TRUMAN W. BROPHY,

G. W. DITTMAR,

CHARLES R. E. KOCH, Chairman,

Legislative Committee.

COPY.

Chicago, February 19, 1913.

Hon. Edward S. Dunne,
Governor of Illinois,
Springfield, Illinois.

My Dear Sir:

Referring to the pleasant audience given to Doctors Brophy, Dittmar and myself at your residence in Chicago before you entered upon the arduous duties of Governor, and in carrying out your expressed wish at that time, we take pleasure in presenting the status of the State Board of Dental Examiners with reference to the people; with reference to the dental profession, and last but not by any means least, with reference to yourself.

At the outset, permit us to inform you that the dental profession of the State is an organized body containing about 1,700 active members, whose aim and object is to improve the methods of dental practice, and to encourage better dental education with the final purpose that the people shall have better dental service. The member-

ship is composed of men of all parties, and partisan politics has never entered into its deliberations.

In connection with the object above stated, this Association has always been active in securing laws that shall accomplish the purposes outlined. The Dental Board was created and is composed of five members appointed by the Governor, each for five years, but in such manner that there should be only one appointment a year, thus securing always a majority of experienced members in the councils of that body.

We, the undersigned, are the Committee on Legislation of the Society, whose special duty it is to look after the appointments upon this Board, in so far as the Governor will permit this Committee to do so. The Committee has never nominated men for appointment on this Board, but the last two Governors have consulted this Committee with reference to the qualifications and availability of the candidates they had in mind to appoint. During the last ten years no man has been appointed on this Board by the Governor without having had his qualification for such appointment first passed upon by the representatives of the State Dental Society.

Should you desire to consult our Committee before making appointments, or with reference to any other matters in connection with the administration of this Board's work in the State and its effective relations beyond our own State line, we shall at all times be glad to respond to your call and co-operate in the success of your administration. To this end we should be glad if we could have another interview with you sometime next week at Springfield.

We beg to assure you that we have no desire to interfere with the high prerogative of your office by presenting for your consideration the name of any candidate, and that we tender our services to you with the hope that this tender may be acceptable to you.

Very respectfully,

CHARLES R. E. KOCH, Chairman,
Legislative Committee.

COPY.

Chicago, March 18, 1913.

Hon. Edward F. Dunne,
Governor of Illinois,
Springfield, Illinois.

My Dear Sir:

Following out your request at the close of our interview a week

ago, we beg to remind you that the Illinois State Board of Dental Examiners is in affiliation, co-operation and consultation with the National Association of Dental Examiners, which is composed of the Dental Boards of thirty-six of our States; and that, therefore, the men selected by you for appointment on this Board should be men who can reflect credit upon you and upon the State of Illinois by their personality and professional standing.

We further wish to remind you that at the present time the Secretary of the Illinois Board is also the Secretary of the National Board of Dental Examiners, which will hold its meeting in July or August, and that if you desire to make any change in the member who holds this office, it would be detrimental to the professional interests to have such an appointment made earlier than September.

In this connection permit us to state that a similar condition existed eight years ago when Governor Deneen assumed the position you now hold. At that time the Secretary of the Board, who was a Democrat, and although his term had expired, was permitted to hold his office and discharge the duties of it during the first four years of Governor Deneen's incumbency. In this case, the man is politically a Republican, but inasmuch as the office should be located in Chicago and there is now a vacancy for a member of the Board in Chicago, aside from that of Dr. Broadbent, the Secretary, we would suggest that you select a man as early as possible, acceptable to yourself, to fill this vacancy, and give him an opportunity of becoming acquainted with, not only the duties of membership on the Board, but also of the duties of the Secretary's office, so that when the time comes that you feel that you must make a change in the Secretary's office, you will have a man thoroughly informed with regard to the duties, intricacies, precedents and laws governing the case.

In behalf of the organized dental profession of the State, we would request you not to make all your appointments at once. The original law contemplates that one member should go off each year, so that always the majority of the Board shall be experienced men with reference to the duties of their offices.

Dr. Pruyn, of Chicago, whose term of appointment has expired more than five years ago, is anxious to be relieved, and an early suitable appointment in his case is desired.

Hoping that this statement is in conformity with your expressed wish, we are,

Very respectfully,

T. W. BROPHY,

G. W. DITTMAR,

CHARLES R. E. KOCH, *Chairman*.

P. S.—While this fact may not at all influence you in your decision of appointing successors to the other members of the present Board, we affix the subjoined memorandum of vacancies that are now existing or will exist on the Board on the first day of July:

Dr. C. P. Pruyn, of Chicago; Dr. W. F. Whalen, of Peoria, and Dr. T. A. Broadbent, secretary, of Chicago.

PRESIDENT'S ADDRESS.*

BY T. A. HARDGROVE, D. D. S., FOND DU LAC, WIS.

Ladies and Gentlemen of the Forty-fourth Session of the Wisconsin State Dental Society:

It would be hard for me to express in words how I appreciate the honor of welcoming you to this session and to this, my home city. My connection with the Wisconsin State Dental Society extends now over a period of twelve years, and during that time it has been my pleasure to notice that its meetings were always dignified and impregnated with a spirit of progress. I noticed also that the members taking part in the activity of its meetings were usually brilliant and sincere and were, if I may be permitted to say it, of a higher type than at similar meetings held in many other places. To become its president then just at this time is an honor of which I am very proud.

RESEARCH FOUNDATION MOVEMENT.

You are all aware of the work accomplished by the Research Foundation Commission. The work of Hartzel, of Minnesota, alone, which has been of such great assistance to both the medical and dental profession, answers, in part I might say, in the affirmative the question put to the dental profession by Dr. Mayo, about two years ago, when he said that the next

*Read before the Wisconsin State Dental Society, July 14, 1914.

great step in preventive medicine should be made by the dental profession and then asked: "Will they do it?"

With these accomplishments in view and a society with a great deal of talent, some dormant and much of it active, I would suggest that an effort be made to start a research worker in our own state, working in connection with the Research Foundation Commission. I do not know, but I believe we could obtain the use of equipment and laboratory space at the University of Wisconsin, and if not there it may be that arrangements could be made with Marquette University or some institution with equipment.

DENTAL CARIES.

This one of the diseases that has been in existence since the birth of the first organism capable of producing decay and that is surely a very long time, and precedes the beginning of what we now call man. We have been at work in a way not altogether too scientific, and we have not entirely solved the problem. For instance, we do not know whether the immunity acquired by our patients against decay, after a period of mechanical effort, is entirely due to the effort of the patient and the dentist in a local way, or whether like other diseases the disease is checked by the natural process; in part at least by the creation of antibodies that influence the fluids of the oral cavity so as to resist the growth of bacteria. Nor do we know but that organisms responsible for the condition known as pyorrhea alveolaris do not exist and are but the modified organisms that in a more active state may have caused decay of the enamel, but being changed or attenuated and not able to attack the teeth expend their efforts on the softer tissues, causing such pathological changes as are responsible for pyorrhea alveolaris. This much we do know, that patients afflicted with one do not seem to be so prone to the other. It is, I believe, worth investigation and I trust that some one in our state may in future work out its solution.

STATE SOCIETY DENTAL JOURNAL.

The society has, as you are aware, successfully launched a State Dental Journal, which is not as large nor does it contain articles as long as its editor would have it do if there were more funds available. But it is a clean, wholesome journal

with the ear marks of a journal entitled to a prominent position in dento-medical literature, and at this point I wish to say that it has not stooped to the use of the illiterate platitudes being made use of by so many state dental bulletins that we notice in the last year. If the profession is to reach the goal at which it is aiming, its literature must be of a high standard, as that is its record, and by which it will be judged. I would not deem it unwise, if done with caution and judgment and in the interests of the future of the profession, that literature below the standard should receive a vote of censure sufficient to stimulate it to a more healthful character.

PYORRHEA ALVEOLARIS.

It is my earnest hope that some part of Dr. Federspiel's paper may stimulate a discussion of this most important branch of pathology, which is, I believe, responsible for more remote and obscure pathology than any other one source in the human body. So many conditions are being charged to the tonsils as a source of infection that I often wonder if the tonsils do not receive their initial infection from pyorrhea alveolaris and kindred conditions. A great complaint is being made just now of the dentist who calls everything pyorrhea, but when analyzed no great harm can rise from a premature diagnosis and treatment, as it results only in preventive dentistry. Think, if you will, over your patients who have or have had arthritis or so-called rheumatism, endocarditis, myocarditis and kidney disturbances who have had associated with them pyorrhea alveolaris, the permanent cure of which will require something more than prophylaxis, which is, I believe, practiced altogether too freely. I do not believe it wise to disturb the nice union nature has established between hard enamel, the dentin and the soft tissue, the bone, or alveolar process penetrating with sharp edges the interproximal space of which the slightest bruising may produce an inflammation which may result in a serious case of pyorrhea later on. I am not complaining about honest prophylaxis, but I do believe that the wholesale application so generously advocated is wrong, and as a society we should avoid as many mistakes as we can. I trust also that from some part of Dr. Federspiel's paper a discussion of the vaccines and vaccine therapy may be brought out, because whether we inject

a vaccine or administer it by absorption, brought on by instrumentation, it is surely playing an important part in the cure.

THE DENTAL QUACK AND DENTAL EXAMINING BOARD.

The dental quack should be eliminated, and in order to bring this about the Wisconsin State Dental Society should assist the board of examiners to protect the public against the lowest of human saprophyte, the quack who taken advantage of the suffering public which is ignorant of his practice until it is too late. It is a difficult matter for a state board to accuse and then sit as judges. Some one must make the complaint and then the state board can act. We have in this state a law that will cause a dentist who employs an unlicensed dentist to lose his own license, and the part the state society can take, is to make the complaint and protect the public. We have been favored in this state with a secretary on the board who has worked faithfully to rid the state of this class, but the task is a large one. If you are in doubt as to what he has done just step into his office and examine the records and you will come away convinced that a great deal of hard work has been done, that much has been accomplished and that his task is a difficult one. I would suggest then that the state society make some effort to assist the state board of examiners. The time is ripe and the dishonest practitioner in dentistry, or quack in other words, must go, the same as he is going in the practice of medicine. It is high time that we rid the state of this pest.

SALARY OF SECRETARY.

I wish to call your attention to what seems to me to be an injustice. The salary of the secretary of this society should be raised. He receives for his work \$60.00 a year. There may have been a time in the earlier history of the society when that amount was sufficient remuneration for the services he rendered, but things are different now. The business of the society through its secretary, if for only the same number of members, is much greater today than it was in the past. Then we have or will have very soon our connection with the National Dental Association, and many new features that will require the attention of the secretary, together with a growing membership. To bring about a change in the by-laws, such as would be required

to raise the salary of the secretary, would cover a period of two years, and as it would be improper to ask the secretary to work for the same salary during that time, I would recommend that an appropriation be made that would properly remunerate him for his services.

My attention has been called to a matter, which, though small in appearance, if allowed to go unnoticed will result in a great deal of embarrassment to say the least. Those of you who have been reading some of the magazines may have noticed the advertisement of the L. D. Caulk Co., with regard to De-Trey's Synthetic Porcelain. The advertisement is here and may be read. The criticism of the Alameda County Dental Society, of California, is also here and should be read. I will not elaborate on this phase of ethics, but wish to offer my protest to what I deem an interference. The profession is the only source from which advice of that kind should come. But matters like this only demonstrate how necessary a Research Foundation Commission is, who will work out and take care of problems of this sort, and I predict that when some one is at work in the right direction a product may be produced that will fill the requirements of which only a dentist should be the judge.

FIFTIETH ANNIVERSARY.

We are approaching and in a few years will be called upon to celebrate the fiftieth anniversary of the birth of this society. While I do not believe the meetings from this until that time should be deprived of good programs, yet something in the way of economy should be practiced so that we will have funds on hand to celebrate our fiftieth anniversary in a fitting manner and in keeping with the progress of the time. In another five years dental meetings will be quite different from what they are even today. Dental practitioners will not be giving clinics entirely along mechanical lines, but will come to give their clinics or demonstrations with their microscope, demonstrating their pathological findings. Vaccine therapy, which is in many states occupying a large portion of the attention at the meetings, will be greatly advanced in the next five years, and when properly understood will occupy no small part of the practice of the profession. With these things in view you can

imagine something of the magnitude of the meeting to be held at the time of our fiftieth anniversary.

I should dwell longer on many things that are important, and many more which could be mentioned in this address, but a vicious attack of pneumonia, followed by inflammatory rheumatism, has robbed me of taking a greater part in the arrangements of this meeting, and prevents me even now, on the protest of my physician, from presiding at this meeting of my profession, to which I am attached more firmly than anything except my family.

With these remarks and the concluding apologies for not presiding, I thank you.

REMINISCENCES OF SEVENTY YEARS' PRACTICE.

BY DR. LOOMIS P. HASKELL, CHICAGO.

(Continued from September DENTAL REVIEW.)

In 1851 we purchased of John Allen's agent a license for the construction of continuous gum dentures, for which we paid \$150. Twelve dentists in Boston purchased licenses. One year later they all had abandoned the work as worthless, but I have used it continuously ever since, and it remains to-day the only ideal artificial denture. When properly made it is the most durable and artistic work in or out of the mouth. I have seen great numbers of my dentures in wear 25 to 40 years. Why did those dentists abandon its use? I said if the work was made according to instructions it would not prove a success. The plate was struck with no wiring and the teeth set up and invested. The wax was removed, porcelain applied to necks of the teeth, partially baked, investment removed and porcelain applied to the outer surface, baked; gum applied and thus completed. I said it would never stand wear, so I backed and soldered the teeth and they were anchored, and the work strengthened.

In 1857 I came west and located in Chicago with Dr. W. W. Allport, who was one of the most distinguished operators in his day. He was famous as a soft gold operator. He was a very rapid operator, using the fewest instruments of any one I have ever seen.

From 1857 up to the time of the fire in 1871 he occupied with his family a brick three-story and basement dwelling in a block at the corner of the alley adjoining the Venetian building now occupied by the new Field building. My laboratory was on the third floor, so I had some traveling to do. He had a barn and kept a horse and cow. Imagine it now!

On the adjacent corner, State and Washington, was a marble yard and between that and Madison streets frame cottages. There was no business on State. Where Marshall Field's store is there was a brick dwelling and vegetable garden.

Business, wholesale and retail, was on Lake street.

Dental supplies were sold by J. H. Reed, druggist. Jones, White & McCurdy opened the first dental supply house several years later.

In 1889, on a visit to Boston, Dr. Cumings, an old acquaintance, took me aside and showed me a set of teeth on what he called rubber, and which he had an interest in and would soon be placed on the market. The next year Dr. Allport purchased a license and we at once began its use, the first in Chicago. The earlier cases we sent to New York to be vulcanized, and later procured a vulcanizer. It was about, as I remember, eighteen inches high and ten inches in diameter, and we used it on a coal melting furnace.

After about two year's use we noticed an unusual change in the gums, as compared with my thirteen years' use of metal plates, and I have realized it ever since, owing to the retention of undue heat, from non-conductability of rubber. Some years later I had an unusual experience arising from the use of the red rubber owing to the coloring matter, bisulphide of mercury.

A lady living in Kansas, by advice of a mutual friend, called to see me. For eleven years she had worn a red rubber plate and during the time had chronic diarrhea, which no medicine would relieve. I made a continuous gum set. Some months later she dropped and broke a tooth. It came for repairs and was out of the mouth nearly a week. Six months later she called to see me and related her experience. She said upon wearing the new set her diarrhea had ceased, but upon wearing her old plate, in the absence of the new one, it reappeared.

Her physician, a homeopath, said he had been treating her for symptoms of mercurial poisoning.

I had three other cases, two sisters, with precisely similar experience.

A lady called upon a former student of mine and said she had a serious throat trouble, and had even been to New York to consult physicians, who said it was owing to some stomach trouble. The dentist told her to leave out of her mouth for two weeks a red rubber plate. She did and the relief was prompt, so he made a black rubber set. Some months later she said the old trouble had returned, and she thought it was owing to chewing rubber gum, and so it proved. I have used ever since the maroon colored rubber.

Dr. Allport's fee was \$50; other dentists charged less, and one advertised at "Eastern prices."

There was an easy fusing metal, called cheoplastry, for casting plates, and it was used with some success for a time.

Later a dentist in Louisville introduced a material made from gun cotton, for plates. It was a very good gum color, but that was its only merit, so was short lived.

Then came celluloid, which had a great run for a few years, but was generally abandoned. I used it exclusively for several years, during the vulcanite controversy, trying to convince myself that it was a good thing, but gave it up, finding its only merit was its color.

The next move for a cheap plate in metal was aluminum, and it came to stay, for it is a good material in all respects. There has been only one objection to it, and that is sometimes, but rarely, a disintegration, from, thus far, causes unknown. In my more than twenty years use I have had but two instances, one of which the patient had worn the plate eighteen years, but it was all decomposed.

It is strange to what an extent the metal plate has been abandoned. In 80 per cent of the dental offices it is apparently a lost art, and what few are made resort to is had to the "laboratories." The student in college largely ignores it and takes no pains to perfect himself in it, so when he goes into practice he is at a loss to know how to do it and sends to the laboratory.

A BRIEF HISTORY OF NITROUS OXID.*

BY DR. H. E. TOMPKINS, NEW YORK CITY.

In presenting the following paper, the writer has assumed that his readers are too busy to go into details or to follow a lengthy discussion of the history of nitrous oxid and the apparatus for its administration; therefore, he has presented the subject in tabloid form that it may be assimilated easily.

No attempt has been made to give a complete world history of the gas, the subject is confined to its history as made in the United States with but few references to the foreign events that have influenced its American history. Neither has any attempt been made to include in this paper the recent apparatus offered to the world by the medical profession for the reason that few possess sufficient merit or originality to be classed as events in the history of this gas, at least, that is the opinion of the writer. The items given mark events or advents in the history of gas administration and each and all show the trend toward a scientific mode of administration and an elimination of mortality, or fatality, if you prefer, neither of which has been attained as yet. Except in a few cases, no attempt has been made to show the influence of the events. The events, only, are given with little or no comment.

If any of the events as given are found to be incorrect, if any events of importance have been omitted, the writer will be very glad, indeed, to be set right.

1772—Joseph Priestly discovered nitrous oxid (dephlogisticated nitrous air or oxid of azote) by the reduction of nitric oxid by moist iron. This was the result of his early experiments and was the first of the five great discoveries in the history of the gas.

1776—Priestly again discovered that nitrous oxid could be made by reducing nitric acid by some of the metals such as copper, tin, zinc or iron.

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1793—Deimann and other Germans found that gas could be made by heating ammonia nitrate to a temperature of about 480° Fahrenheit. This was the second great discovery in the history of nitrous oxid and forms essentially the method in use to-day for the commercial production of the gas.

1798—Sir Humphrey Davy announced his discovery of the anesthetic and analgesic qualities of the gas. It was in this period that Davy became almost a fiend for the gas, as will be seen by reading (1800) Sir Humphrey Davy's book, "Researches, Chemical and Philosophical, Chiefly Concerning Nitrous Oxide or Dephlogisticated Nitrous Air, and Its Respiration." In this book he describes how he, when suffering from headaches or when very tired, would go into his gas tight chamber and breathe the gas, after which his aches would leave him, he would be exhilarated and seem like a new man. In particular, he mentions that he was suffering from a toothache or inflammation of the gums, one day in 1799, and upon going into his chamber he was surprised and delighted to find that the gas relieved his pain. This led to his conclusion: "As nitrous oxide in its extensive operation seems capable of destroying physical pain, it may probably be used with advantage during surgical operations in which no great effusion of blood takes place."

1808—Wm. P. C. Barton, a student at a Philadelphia medical school, in his graduation thesis, writes on "The Chymical Properties and Exhilarating Effects of Nitrous Oxide Gas." This is a review of Davy's book, and in it he describes experiments conducted in private and at the school. He mentions in particular his sensations on inhaling the gas while carrying himself to unconsciousness and back. In one experiment he inhaled five quarts of the gas and, as he says, "fainted." When revived he declares he fought vigorously and fiercely. He further describes how other fellows would "faint" and how it was necessary to carry them to a window to revive them. He also tells how when some of the men would breathe the gas from a bladder, they would hold their noses, and mentions one case in which the fellow pinched a small piece off the end of his nose without pain. He, too, calls attention to the pain relieving qualities of the gas.

1818—Michael Faraday points out the pain relieving quali-

ties of nitrous oxid and notes that the vapor of sulphuric ether possesses similar properties.

In this period, Prof. Thompson of Glasgow amused his pupils by allowing them to breathe the gas from bags or bladders until it was found that they were insensible to the prick of a pin or to heavy blows.

Despite these reports of the pain relieving qualities of the gas, no attention was paid to the anesthetic or analgesic properties or possibilities, as such.

1823—Faraday discovered that the gas could be compressed to a liquid under a pressure of about 750 to 800 pounds. Heretofore, when necessary, the gas was transported by dissolving it in water.

This formed the third great discovery in the history of the gas, and next to the discovery of its anesthetic qualities probably has done more to make its use general than any other event.

1844—Mark the year in which the greatest discovery and achievement in the history of anesthesia occurred. So great was the event that a full description may be given and yet prove interesting.

On December 11th, 1844, Dr. C. Q. Colton, who had been lecturing in this country on popular scientific subjects, and who had been a pupil of Prof. Turner, a professor of chemistry at the University College, London, delivered a lecture at Hartford, Conn.

A man named Cooley was among those invited to inhale the nitrous oxid gas, to show its effects. Cooley did inhale the gas and became almost if not quite unconscious and fell, wounding himself severely. Dr. Horace Wells was in the audience and was struck by the peculiarity of the incident. It occurred to him that the effect was truly anesthetic, and after the lecture he arranged with Dr. Colton to come to his office to administer the gas and to let Dr. Riggs extract a badly decayed molar.

Dr. Riggs describes the operation thus: "A few minutes after I went in, and, after conversation, Dr. Wells took a seat in the operating chair. I examined the tooth to be extracted, with a glass, as I usually do. Wells took the bag of gas from Mr. Colton and sat with it in his lap, and I stood by his side;

he then breathed the gas until he was much affected by it; his head dropped back, I put my hand on his chin, he opened his mouth, and I extracted the tooth. His mouth still remained open some time. I held up the tooth with the instrument that the others might see it; they, standing partially behind the screen, were looking on. Dr. Wells soon recovered from the influence of the gas so as to know what he was about, discharged the blood from his mouth and said: 'A new era in tooth pulling!' He said it did not hurt him at all. We were all much elated and conversed about it for an hour later."

After this Wells extracted several teeth from patients, using the gas as an anesthetic, with uniform success. He then went to Boston and tried to demonstrate his discovery to the medical profession. After several days he was finally invited by Dr. Warren to give a talk on anesthesia to a class at the Massachusetts General Hospital. This he did. After this he was asked to extract a tooth under the gas.

Wells says the experiment was not a success for the reason that the gas bag was taken from the patient too soon. Pain was felt by the patient, Wells was denounced as a humbug and hissed from the room.

He finally wandered to New York and after roaming the streets, he was arrested on January 4th, 1848, charged with throwing vitrol. While in jail he opened his radial artery after inhaling ether to make death painless.

And so Horace Wells, to whom the world owes thanks for the relief of pain in all surgery, closed his own career at the age of 32 years, a broken hearted, unappreciated man, as were both Jackson and Morton of ether fame.

For some time after this period nitrous oxid was used for spectacular purposes but occasionally the more progressive of both the medical and dental professions used it for its anesthetic qualities in surgery.

1854—A. W. Sprague, of Boston, toured the country giving lectures on nitrous oxid gas as an anesthetic. He advocated the abolition of the bladders and bags and advised the use of pure gas. He further advocated the use of a valved inhaler, incidentally selling gas administration apparatus and apparatus for the manufacture of gas. What he has to say of the administra-

tion of gas is interesting, for some of his principles can be used with success, even to-day. He says: "Economy of gas and successful anesthesia require the observance of certain conditions in inhaling. The lungs should be expanded to their full capacity by several inspirations of air before any gas is given, as the amount of oxidation of the blood has to do with anesthesia and as air and nitrous oxid both act the same but in different degrees. A few such breathings will serve to calm the patient and greatly aid the effect of the gas. The air may be given through the inhaler."

"Avoid inhaling the gas too rapidly at first. Breathe in full breaths, slowly, and exhale the same. The object is to retain the gas as long as possible in the lungs and to allow it to be absorbed in the blood. Should the patient seem distressed give a single breath of air through the nose. This will usually afford relief and retard but little the anesthetic effect."

"Or should the patient stop breathing and act balky, giving the nose to exhale will often right the breathing. Until the blood is decarbonized, the elimination of carbonic acid in the lungs is often so rapid as to produce temporary suffocation. This may be relieved as we have directed."

He cites case after case in which impure gas was the cause of distressing results. He pleaded for a standardization of methods of making pure gas and he seems to have accomplished his purpose. Please note that he suggests the use of air to eliminate cyanosis.

1862—Charles B. Porter patented a chloroform inhaler with which other anesthetics could be given. He mentions that any anesthetic, either gaseous or vapor, can be administered with his appliance.

This appliance never became popular for it was twenty years ahead of its time.

1863—Up to this time nitrous oxid was more or less dormant, it seems, for this year the gas received its greatest impetus and became more popular.

1863—A dentist named Smith, of New Haven, had Dr. Colton administer the gas to one of his patients with such success that both he and Colton continued its use. Colton went to

New York where he established the Colton Dental Association for the extraction of teeth by the use of gas.

1863—This year Prof. E. Vander Weyde demonstrated his gasometer apparatus before the Dental Association of New York. Vander Weyde seems to have been the first to use a gasometer as part of an administration apparatus.

1864—Simeon W. Albee, of Charlestown, N. H., patented a face inhaler which is practically the same as the one in use to-day. It had both an expiratory valve and an inspiratory valve to prevent rebreathing of the expired gas. The arrangement of the valves permitted the admission of air for the control of cyanosis.

1864—Dr. D. H. Goodwille, of New York, brought out a valved inhaler which was worthy of more attention than it received.

1864—Prof. Vander Weyde, in a letter to a friend, said: "I expect to erect a factory for the preparation of liquid gas and to send the gas in a cylinder to the house of the surgeon." A commentary says: "If this is practicable it will overcome the principal objections to the general use of this anesthetic."

The writer has been told by a man of years that Vander Weyde did compress the gas into cylinders and sold it for a couple of years, but because of the frequent explosions of the cylinders he was compelled to give up the work. No record has been found of such work by Vander Weyde, so it is given that you may take it for what it is worth.

1864—On January 14th, 1864, Dr. Jose R. Brunot made the first reliable report of a death with nitrous oxid. H. P. Sears, the patient, was given the gas for the extraction of a tooth. He was taken with a hemorrhage and never recovered. The autopsy showed a very bad case of tuberculosis and to this the death was attributed.

On January 29th, 1864, Dr. Gillman reported the second death ascribed to nitrous oxid. A Miss Bell died about a week after having inhaled the gas for fun. Death was said to have been caused by spinal meningitis as a direct cause.

1864—Samuel Lee Rymer, a London dentist, reported his experiments with nitrous oxid, using a bladder and rebreathing. His results were quite satisfactory.

1865—Dr. Geo. T. Barker, of Philadelphia, brought out a gasometer apparatus used in connection with a valved inhaler, of peculiar design.

1865—Dr. Colton reported 20,000 cases of nitrous oxid anesthesias with no fatalities.

1865—Dr. Geo. T. Ziegler published the first book on nitrous oxid as used for anesthetic purposes. "Medical Properties and Applications of Nitrous Oxide." Previous to the publishing of this book, Dr. Ziegler had contributed articles on this subject to the *Dental Cosmos* and various other papers.

1866—Dr. Geo. T. Barker published his "Instructions on Nitrous Oxide." This book is exceedingly interesting because of the directions given for the administration of the gas.

1866—Prof. Carnochan in the *Medical and Surgical Reporter* for February 10th, 1866, reports his use of nitrous oxid for major surgery. He says: "I have used this gas on seven capital operations. * * * I have also used ether and chloroform but my opinion in regard to the superiority of nitrous oxide as an anesthetic is still unchanged." He claims to have had no bad effects and no fatalities. His operations covered a period from July 1865 to February 1866 and consisted of amputations and trunk operations.

Please note that this was before the day of the use of oxygen as an adjunct in gas anesthesia.

1866—Dr. Samuel S. White brought out Willson's automatic inhaler for use with nitrous oxid gas. All inhalers brought out since 1865 seem to have been influenced by the teachings of A. W. Sprague. This inhaler of Willson's was good but it did not stay on the market for any great length of time.

1866—Prof. Joseph Pancoast reported the removal of a scirrhus breast under nitrous oxid as the anesthetic. He says his operation covered a period of twenty minutes and at no time was there any danger.

1868—Dr. Evans, of Paris, demonstrated an apparatus for the administration of nitrous oxid which was thought to have been the first to prevent rebreathing by valves. Dr. Evans has been erroneously credited with this honor for it is evident that Dr. Albee brought out his apparatus or at least his inhaler in 1864 (which see).

1868—Dr. E. Andrews, of the Medical College, Chicago, started his experiments with the combined gas-oxygen anesthesia. His reports are embodied in the *Chicago Medical Examiner* for this year and in the *British Journal of Dental Science* for 1869. To Andrews great credit is due for having discovered a method of administering nitrous oxid with a complete lack of the usual asphyxial symptoms.

His work forms the fifth great epoch in the administration of nitrous oxid as an anesthetic.

1869.—Clover of England, brought out his nitrous oxid apparatus.

1869—In this year nitrous oxid was first (authentic) liquified for commercial purposes by Barth of England.

1870—Dr. F. R. Thomas, of Philadelphia, published his monograph: "A Manual of Nitrous Oxid." This book is interesting only because of the method of administration advocated. It is well worth reading not only because of the good sound sense displayed but for the amusing situations depicted, such as holding a patient's nose while he is taking the gas.

1871—This year marks an era in the use of nitrous oxid, for it was during this year that the Johnson Brothers, of New York, started to liquify gas commercially by a process patented by them. This firm was the first to make liquified nitrous oxid in America.

1875—Dr. Samuel S. White, following the lead of the Johnsons, started to compress gas.

1877—Dr. William Boekel, of Philadelphia, in this year patented his inhaler which is the same general design as the so-called Simplex inhaler of to-day. This was the first inhaler by which special regulation was provided for the admission of air for inhalation. It will be remembered that this inhaler fits only over the mouth.

1878 to 1883 marks the period over which the classic experiments of Paul Bert extended.

1879—The Johnson Brothers patented a new valve for gas cylinders which is still in use by the S. S. White Dental Manufacturing Co. A few changes may have been made in the general design but the basic principles involved remain the same.

1880—That nitrous oxid was becoming more and more pop-

ular is evidenced by the fact that the Keystone Gas Generating Co. (which was practically owned by and its entire output controlled by H. D. Justi) started to produce liquified nitrous oxid at Philadelphia.

1881—The experiments of Klikowitsch, Winckel, Doderlein and Zweifel demonstrated the analgesic effects of nitrous oxid and oxygen. This forms the first record (sic) of nitrous oxid analgesia.

1881—The S. S. White Dental Manufacturing Co. was formed this year by the consolidation of S. S. White and the Johnson Bros. This firm brought out in this year a portable surgeon's case with apparatus for the administration of the gas at the patient's home and a gasometer outfit for office use.

1882—Dr. C. Martin, of Lyons, France, put Bert's experiments into practice so far as the use of gas-oxygen was concerned.

1882—The usefulness of nitrous oxid was finding a greater field for we find that the Cleveland Nitrous Oxide Co. started to produce liquified gas during this year. This firm was bought out by or changed to the Lennox Chemical Co. two or three years later, since when it has been known by the latter name.

1883—H. D. Justi began to assert his influence in the field of nitrous oxid for we find that he brought out the Nevius gasometer apparatus.

1883—A new firm also entered the field, the Buffalo Dental Manufacturing Co., which brought out the improved gas cylinder yoke, the Lewis Gasometer and the wheel key for operating the valve of the gas cylinder. This key and yoke are the same to-day as when brought out in this year.

1884—This same firm brought out the first of the "Vitalized Air" attachments for gas apparatus. This was an arrangement by which a quantity of chloroform vapor could be mixed with the gas.

1885—The same firm brought out an improved form of chloroform mixer which was the invention of Dr. Theodore G. Lewis.

It might be said in passing that back in 1862 Porter brought out his chloroform inhaler but he failed to impress the profession with it.

1885—In an effort to make the use of nitrous oxid more general H. D. Justi announced a reduction in the price of gas from five and six cents per gallon to three and a half and four cents per gallon.

1885—The S. S. White Dental Manufacturing Co. brought out a wall bracket apparatus and the Down's stand and yoke for the administration of the gas.

1886—This firm in this year patented the gas cylinder yoke which is in use to-day.

1886—Dr. Hillischer, of Vienna, was first to systematize the administration of nitrous oxid and oxygen at atmospheric pressure. He had used a gasometer apparatus but discarded it for an apparatus by which he could regulate the quantities of gas and oxygen given. He reported all told about 15,000 cases and was very enthusiastic.

1886—Dr. Frederick C. Hewitt, of London, also, brought out a gas regulating apparatus which he afterward modified time and again to meet varying conditions.

1889—S. S. White Dental Manufacturing Co. brought out their improved face inhaler, in its various forms. This inhaler is known as their No. 3.

1891—Graham W. Clark, then an employee of the Lennox Chemical Co., developed an improved gas cylinder valve which has tended to make the administration of gas much easier.

1894—This year marks the advent of the gas-oxygen apparatus as we know it to-day.

Dr. F. C. Hewitt perfected and gave to the world his apparatus. With this machine it was possible to give any desired percentage of gas or oxygen or both, within the limits of the machine. This was a one handled controlling valved apparatus and was one of the first of this type.

Dr. Sydney Rumboll, of Leeds, Eng., also brought out and patented his apparatus which gave perfect control of the amount or percentage of gas or oxygen or both. It permitted or prevented rebreathing as desired and as a matter of fact became the model of the several machines that have appeared on the market within the past two or three years.

This apparatus, too, was of the one handled valve design.

1894—Claudius Ash & Sons brought out the pressure regulat-

ing or reducing valves of Weller and of Edgelow. The Weller valve is still on the market and gives nearly perfect control of the pressure of the gas, which can be changed at will.

1896—The S. S. White Dental Manufacturing Co. this year made a signal advance in the safety of handling nitrous oxid commercially by bringing out a seamless steel cylinder.

1899—This same firm brought out a combination gas-oxygen apparatus which has served and is serving its purpose admirably. The apparatus was made in two and three cylinder sizes, the only objection to it is its weight.

1899—Dr. Charles K. Teter patented his gas-oxygen apparatus. Both he and his apparatus have done much to further the administration of the gases with safety.

1901—The Penn Nitrous Oxide Co., sometimes known as Johnson and Lund, started to compress nitrous oxid this year at Rochester, N. Y.

1902—The Lennox Chemical Co. perfected and patented what has been known as the Brown anaesthetiser. The principal object of this apparatus was to prevent the freezing of the gas as it flowed from the cylinder.

1902—Dr. H. W. Carter, of New York, reported the perfection of a one handled gas-oxygen controller for attaching to the Bennett ether machine.

1903—Dr. Chas. K. Teter patented his nasal inhaler which has made possible the continuous administration of gas-oxygen throughout an operation in the mouth.

In this year, too, Dr. George N. Guthrie, of Cookville, Tenn., patented a nasal inhaler which possesses great merit but which was never introduced to the profession.

1903—Dr. William A. Heckard patented what he called his "Equalizer." This was an apparatus which consisted of a large tank with the necessary tubing, yokes, valves and gauges for turning the gas from the cylinder where it was at a very high pressure into the tank where the pressure was about 100 pounds to the inch. From this tank the gas was administered directly to the patient by the open method.

Dr. Heckard realized the value of his invention but despite that fact he gave his ideas and experience to the profession with no restrictions, about two or three years ago.

The principles of the idea were never appreciated until very recently, but of this we will speak later.

1903—Dr. M. J. Emelin, of New York, announced his theory of the warmed gases for administration. His theory is accepted as fundamental to-day by the majority of men.

1907—Dr. George T. Gregg, of Pittsburgh, started his experiments in analgesia. The conclusions at which he arrived, he announced in October of 1909.

To Dr. Gregg belongs the credit of announcing the analgesic (sic) qualities of gas, oxygen and air. Although the idea was years and years old, he was the first, so far as the writer is able to discover, to bring it to the attention of the professions, as such.

1907—The Standard Oxygen Co., of New York, started to liquify nitrous oxid for commercial purposes.

1910—The Ohio Chemical and Manufacturing Co. started business this year at Cleveland. They manufactured liquified gas and several designs of a gas-oxygen machine with reducing pressure valves attached.

Their apparatus resembles, in principles, the machines of both Weller and Edgelow which were brought out in 1894 and both of which gave far more satisfactory results than this new apparatus.

1910—The Standard Oxygen Co. of New York brought out a perfected form of valve for gas cylinders. This valve permits of perfect control of the flow of gas from the cylinder and obviates freezing.

1911—The A. C. Clark Co., of Chicago, brought out a 'new model' one handled gas-oxygen apparatus which is closely akin to the apparatus of both Hewitt and Rumboll which were brought out in 1894. The valve construction, particularly, of the Clark machine is very similar to those of Hewitt and Rumboll, in principle.

1911—Dr. Orval J. Cunningham, of Kansas City, displayed an apparatus which has since gained some renown. This machine is more adapted to surgical work than to dentistry.

1913—The Teter Manufacturing Co. produced their positive pressure apparatus in this year. Following the trend of

the times they, too, incorporated reducing pressure valves in their machine.

1913—Dr. A. E. Geudel, through Lee S. Smith & Son, brought out an obstetrical anesthetic machine which was afterward modified into a dental analgesic apparatus. It would appear that this apparatus was imitated by the Clark Co. and Dr. Luxmore, both of Chicago, as closely as possible without infringing upon Geudel's patent, for each brought an apparatus of this type soon after Geudel's appeared.

The principle involved in an apparatus of this sort was originally propounded by Sprague in 1855 and Albee in 1864. It is the opinion of the writer that this type of apparatus is positively dangerous in the hands of any except experienced men.

1913—Dr. Heidbrink and others have brought out machines of various types and styles, which possess some merit but which are modifications of machines brought out in previous years.

1913—One of the latest machines to appear on the market is that of the S. S. White Dental Manufacturing Co. This apparatus shows originality in the arrangement of its parts. However, no new principles are involved in the administration of the gases.

With this apparatus, the same firm brought out a new nasal inhaler and a surgical inhaler both of which appear logical and proper.

1913—It was not my intention to say anything of the machines brought out by medicinal men but the apparatus very recently announced by Dr. E. McKesson, of Toledo, appears to be so meritorious that we cannot pass it by.

This apparatus involves several new ideas particularly for rebreathing, the control of the gases and the automatic flow of gases regulated by the breathing of the patient. While the writer has not seen nor studied the apparatus, the theory of its workings seem to make it the best of all machines produced up to date.

1913—The very latest apparatus to appear has been the expanding tanks for the administration of the gases under low pressure. This apparatus was brought out by the Lennox Chemical Co.

It is very similar to the "Equalizer" of Heckard's which

came out in 1903. The general idea is that the gas is taken from any size cylinder to the expanding tanks from which it is delivered to the administration machine at a determined low pressure and at room temperature. This is a distinct advantage.

It would seem after a consideration of the events in the history of nitrous oxid and the apparatus for its administration by which its history was made, that there is some truth in the statement—"There ain't nothin' new."

PROCEEDINGS OF SOCIETIES.

ILLINOIS STATE DENTAL SOCIETY.

GOLDEN ANNIVERSARY BANQUET.

The Golden Anniversary Banquet was held in the Grand Ball-room of Hotel LaSalle, Wednesday, March 25, 1914.

At 10:30 P. M. as the Toastmaster (Dr. W. H. G. Logan) arose and rapped for order, three lusty cheers were given for him, and when quiet was restored, the Toastmaster said:

To you the living former Presidents, our honored guests, and to you ladies and gentlemen, our invited guests, I wish to affirm that it is a very pleasant duty for me as President of the Illinois State Dental Society to meet, greet and bid welcome to this large and brilliant company, and I am delighted that so many ladies have seen fit to grace this gathering. (Applause.) I am doubly pleased to see the faces of so many distinguished practitioners of dentistry gathered about these tables, representing practically every State in the Union, each Province of Canada and many foreign countries.

We have gathered here this evening to celebrate our Society's Golden Anniversary and to convey the love and appreciation felt by our members for the founders, builders and former Officers of our Association. But fully realizing that you did not come to hear me declaim and knowing you are impatient to hear those you came to hear, I shall detain you only long enough to state that the first speaker has been an active member of the Board of Charities of this State for many years and was President of the Chicago Library Board when the present building was erected on the lake front. He was one of the important editors of the Jewish Encyclopedia, the first work of its kind. He is the minister of Sinai Congregation

and from the pulpit he speaks for a better citizenship and for a broader Humanity and in every respect is well qualified to discuss the theme "Race Betterment." Ladies and Gentlemen the Rev. Dr. Emil G. Hirsch.

Dr. Hirsch was received with great applause. He said:

Mr. Toastmaster, Ladies and Gentlemen: I know now what your slogan is—it is Logan. (Laughter.) I am wondering why I have come among you tonight. With the medical profession my own profession is on terms of reciprocity. (Laughter.) The minister prays for the sick, and in due time the physician is called in. Again, at the other end, it is the physician who precedes and the minister has to bury his mistakes. (Laughter.) With the legal profession we have close relations. We tie and they untie. (Laughter.) We speak for peace, and they try for disputes. But what in the world I have to do with dentists I scarce can tell, except it be this: I make my living by my mouth, and you do, too. (Laughter.)

If you will pardon a slight digression, I will say, that there is a club in this city that claims university culture. They are very exclusive. Some years ago an architect that was putting up the building consulted me because one of their windows representing the seal of an Eastern College had a Hebrew inscription, and the architect wanted to be sure the lines were Hebrew, not that the average member of that club would have known whether they were Hebrew or not. (Laughter.) I told him that for his sake I would consent to look over the plan, but the club was very anxious to keep me on the outside for no other reason than that I was supposed to have learned Hebrew at home (Laughter), and he told me that was true. I am not a member, but I learned they exclude two classes—dentists and the Jews. (Laughter.) I knew I could come here with perfect confidence (laughter) and if I got into a hole there would be someone who could pull me out. So I wish to say, I am glad to be with you to put the golden crown on your Society. (Applause.) I am sure, your profession is doing its full share in the work of bettering the human race, for, in the first place, you are very active in the crusade against profanity, for when a person is without a dentist and needs one, he is much inclined to use strong and unholy language. When you come to his relief you help, at the same time, to elevate his moral tone.

I will not detain you with peculiar theories, but it is a fact that intemperance is largely caused by poor digestion, and poor digestion is often produced by imperfect mastication. You help us to masticate our food; therefore, you help us to get into a better physical condition to withstand the inroads of disease. You are working for the betterment of the race. The great shibboleth of our day is the betterment of our race. We are talking with a freedom heretofore unknown of conditions produced by laxity of moral conscience, by indulgences, which, in a former age were hidden, but which we now expose to the light of day. On all sides and among all nations the cry is heard that the fate of unborn generations must be considered, and we have no right to blight posterity with curses, but it is our duty to so equip the generations that come after us that they will find the battle of life easier, the temptations fewer, and the victories more. That is a hopeful sign. It is dragging away from us the prudery that covered with silence unpleasant things.

Physically speaking, the sun is the great sterilizer. There is nothing so powerful in the way of sanitation as a full flood of sunlight. In the moral sphere publicity is as beneficial as in the domain of physical things is letting in the sunlight. No nation—let us be happy over it—has ever been more severe in its criticism than our American people. The older nations try to hide evils; we are anxious to expose them, and in our anxiety to tear off the curtain, to let in the full light of publicity, I see the hope for this nation and with it the hope of the world. (Applause.)

Perhaps we have been given in this city a little too much to believe in the efficacy of physical agencies. We forget that whatever may be done in the way of sanitation, in prevention and prophylaxis and in the physical domain must be supplemented by a deeper sense of moral responsibility. You can talk about eugenics until the crack of doom; you can draw up rules to guide people in the choice of their life's partner, and however beneficial such a course of instruction may be, it will fail unless supplemented and complemented by consecration, by a real awakening of the moral sense, by the deepening of the consciousness of ethical obligations. And that is my criticism with reference to many of the proposals that have been advanced recently—proposals well meant, but to my thinking cannot be effectively carried out.

A foreign observer has gone on record in stating to his com-

patriots that the American people have an unbounded faith in the omnipotence of law. Whatever is amiss, we shout for the enactment of laws. We know that people expectorate, and you say, let us enact a law prohibiting spitting. We have such a law. We have a placard in every street car which appeals to the people not to spit, and yet that law seems to be a dead letter. Occasionally we get a spasmodic fever of activity in that line and fifty or sixty of the innocent spitters are assessed one dollar for the privilege of defiling our sidewalks, and then we stop in our crusade.

I was in Europe a few years ago and while there met an Englishman, and he asked me where I came from, and I said from Chicago. "Oh," said he, "Chicago, that is the place where the hogs run around in the streets."

I replied, "No, it is the place where the hogs ride on the street cars." (Laughter.) Whatever tends to injure or impair the health of the traveling public, we shout for a law. We forget we cannot place the police at the hand of everybody. A free people must govern themselves the best they know how, but a law cannot be more effective than the public conscience. A better way for us is to appeal to the moral sense of the community, to deepen it, to intensify it, and then to enact a law. The law can only meet the extreme cases. Before the law you must have an awakening of the people. In many cases the law will not answer. In all cases the law should be observed, and the police force can only look after the extreme cases. Let us not forget that in the betterment of the race we must first have a better consciousness of our social responsibility. We must have one single standard, not as now, demand of women the highest state of purity and allow the men the largest liberty of latitude and laxity. We must appeal to the innermost hearts of men if we wish to see the race better. I do not believe the race as a whole is quite as bad as we have been led to believe. I think we exaggerate, but by mere law and instructions you cannot eradicate evil; by consecration and conscience you may hope to be successful.

Of late years in our country the cry has gone up that the American race is in great danger of deterioration. A professor of the University of Wisconsin is publishing a series of articles in *The Century Magazine* defending that thesis and is sounding the alarm that the American race is in danger of deterioration; there-

fore enact a law against those of foreign birth; keep the immigrants out. It is said, if it were not for the foreigners we should not need any penitentiaries; our alms houses and insane asylums might be turned into dancing halls. I heard so much along this line that when the Governor of the State heard of my intended journey, he asked me to look into the insane asylums and study the subject while I was abroad, and I said to him that I did not think that they had any insane asylums because they shipped every insane person to America. (Laughter and applause.) Personally, I believe the undesirable elements should be excluded—certainly people afflicted with disease, and those that are likely to become dependents or criminals, ought not to be given a welcome at the landing port of America. But what would America be if it were not for the vast number of immigrants? The same cry was raised fifty years ago that is raised to-day. When the Irish came it was said they endangered civilization. When the Germans came they injected into our civilization customs that were different, and when the other nationalities came the alarm was sounded; but the history of America has shown that in this free atmosphere, in this great melting-pot, every race of the world is given an opportunity to cleanse itself of its baser elements, and to contribute its best elements to the new humanity, and we are developing and growing under the protection of our dearly beloved flag. (Applause.) Perhaps you native Americans do not know what that flag means, you are so accustomed to it, but we of foreign birth—I ask you to excuse that delinquency of mine—I was not consulted, and I can promise you it shall never happen again (laughter)—who have seen other flags and have lived under other forms of government have a keen sense of difference between the symbolic value of the Stars and Stripes and banners that we call tyranny and despotism, for American citizenship, as a rule, implies duty, hence the American citizen has to give something to society, and not depend solely upon the nation and state to give him something. We of foreign birth are suspicious of a civilization whose fundamental word is “Get,” get get there. We believe in the higher law—give—give—give, and many of us have given to the new people without stint and without reserve. It would be a sorry day for America if the evolution of the centuries were abandoned. The most foolish test is that which has been proposed, the literacy test. Let us keep ourselves pure and

strong. Why, the strongest girl has been the most illiterate. I have met in very exclusive society in a club to which the state will only admit its chosen select members—a penitentiary—men who could write and read six and seven languages, and yet they were in there. They could have passed the literacy test now proposed—thirty words—in any one language they might choose. If you want to keep out people by that test from coming to America, they will be coached in Europe so as to pass that test, and the result will be the best men will be excluded and the worst may be admitted under that proposed plan. Let us not delay welcoming men and women whose history has been a revolution for freedom, whose institutions were founded by men who have had a deep consciousness of their responsibility and righteousness as the children of God. Certainly, we must all work together if we would have improved morals and a better race than we are having on God's footstool. We must seek that command that they shall not be toothless nor hairless. We shall see to it that there shall be an American race of men and women of new type who have come hither and thither to make this country their home; men with the law of virtue in their hearts; with justice as their guiding star; men who know that the highest service is to give one's self to the weak. With that new American race developing, history will write a new chapter, and the dream of the prophets of old will come nearly true; with that new race doing all that God expects it to do, there will be peace that comes not merely to our land, but to the lands of the world, and let us hope that may be the goal toward which we all shall travel, regardless of the creed or race to which we belong, and the only question we shall address to our brother is, art thou willing to march with us up the hill where the light shines and where liberty dwells. (Loud applause.)

THE TOASTMASTER:

The next speaker's personality, mentality and moral character represent quite accurately my ideal of what should go to make up a worthy professional man, and although he does not reside in the United States, I wish to assure him that we never look upon a Canadian dentist as a foreigner, nor does our association hold, Dr. Thornton, that the interests and ambitions of the dental profession of your country are things apart from the interests and ambitions that bestir our profession. Therefore, it is indeed most appro-

priate that you, the Dean of the Dental Department of McGill University, should respond to the toast "The Achievements of the Past and the Hope of the Future." Ladies and Gentlemen, Dr. Thornton will now address you. (Applause.)

DR. A. W. THORNTON, Montreal, Canada:

Mr. Toastmaster, Ladies and Gentlemen: Since coming to Chicago, and especially since coming into this banquet hall, I have been reminded of something which I read somewhere many years ago: "They shall come from the North and the South, and from the East and from the West, and they shall sit down together." In connection with the great event to which these words refer, I heard sometime ago of a gentleman of Irish extraction who had fallen from the high moral principle that usually characterizes this people. He had stolen something, and for spiritual comfort he went to his father confessor, and he was advised to restore the stolen article, but he felt somewhat diffident about doing it. He was reminded of the fact that some day he would have to stand before the great assembled multitudes of the universe to give an account of the deeds done in the body. He said, "Father, do you think all the world will be there?" "I certainly do," said his father confessor. "Do you think the people of the north of Ireland will be there?" "Oh, sure, sure." "And the people of the south of Ireland?" "Certainly." "And the people of Connemara?" "Certainly, they will be there, too." And then he thought for a while and said, "Father, do you think the people of Ulster will be there and the people of Connemara?" "Sure." "Then, Father, let me tell you this: For the first couple of days there will not be much judging done." (Laughter.)

Mr. Toastmaster, I believe you all agree with me, that the human mind is a great unsolved and undiscovered land, presenting many peculiarities and contradictions and vagaries.

As I sat here and looked into your faces two thoughts were passing through my mind, absolutely unrelated and entirely irrelevant to this meeting or anything connected with it. There were two thoughts concerned, humming-birds and heaven. I had the pleasure a couple of weeks ago of visiting the City of Boston, and I went through the Museum of Harvard University, and in connection with that Museum I saw a beautiful collection of humming-

birds, and as I looked at them I was reminded of the tribute paid to them:

“Minutest of the feathered kind,
Possessing every charm combined,
Nature in forming thee; designed
That thou should'st be,
A proof within how little space,
She can comprise such perfect grace,
Rendering thy lovely fairy race,
Beauty's epitome.” (Applause.)

Mr. Toastmaster, I am persuaded, the man who wrote those words, “Possessing every charm combined,” “a proof within how little space, she can comprise such perfect grace,” must have received the inspiration for those words from attending in Chicago such a banquet as this, graced by so many ladies. (Applause.)

Then I thought of a story I heard of the man who dreamt he had gone to Heaven. He was being shown through the celestial City by a Heavenly guide, and he saw groups of people scattered all over, and pointing to one group he said to his guide, “Who are those people with long faces and with strict demeanor?” And the guide said, “Those are our Presbyterian friends.” Then he pointed to another group having a good time, dancing the tango (Laughter), playing golf, having a good time generally everyone of them, and he said, “Who are those?” “They are our Anglican friends, people of the Church of England.” Then he pointed to another group, happy in their new found freedom and enjoying themselves by a beautiful river, and he said, “Who are those?” “Those are the Baptists. They are good people, but you cannot get them away from that water.” Then he pointed to a large group, and said, “Who are those?” The guide said, “Those are our Catholic friends.” And so they were there in groups—the Arminians and Calvinists, the Trinitarians and Unitarians, the Jews and Samaritans, the Christian Scientists, and Christians who knew nothing about science. They were all there. Finally, he pointed away off to a group which no man could number; they were so far away they could hardly be seen, and he said to the guide, “Who are those?” The guide replied, “Those are our Methodist friends.” “What, so far away from the Throne! Why are they so far

away?" The guide replied, "Those are the only people the Lord can trust out of His sight." (Laughter.)

I wish to say to the ladies that I am pleased to see them. When I look at the number who grace this occasion by their presence and remember the men who were associated with them in bringing to a successful issue this great banquet, there is a lurking suspicion in my mind that some of them are here because they could not trust their husbands out of their sight. (Laughter.)

The history of any nation is the biography of its great men. This is true of a profession as well as of a nation, and the achievements of any profession are the achievements of its great men. It would be ill-fitting on my part now to spend much time contrasting the conditions which existed fifty years ago with those which exist to-day. Those have been sufficiently dwelt upon, and there are those who tell us "the former days were better than the latter." I do not believe it, Mr. Toastmaster. I could recount, if necessary, the great things that the fathers of the profession have done in this country, and I have asked myself, have we to-day worthy successors of those great men? And then I began to think of the men who have stood in the breaches of the profession of dentistry for the past years. I thought of men like G. V. Black and what he alone has accomplished. (Applause.) I thought of his great work in connection with cavity preparation and alloys, and his connection with the great school with which he has been identified, and I said, surely this is a man that we might all strive to emulate. And then I saw sitting together, two men I have learned to revere—Dr. Brophy and Dr. Gilmer. (Applause.) Have you ever seen a child with a congenital hare-lip or cleft palate, and have you thought of the misery and the sorrow to the home in which such a child was born, and then witnessed the change that comes when the deformity is made right, when the handicap is removed, when the speech is made normal? Oh, it seems to me, that it is of such men that the words were spoken, "The people shall rise up and call them blessed."

I remember the first time I saw Dr. Gilmer, who has always struck me as of a quiet, retiring disposition, but one who has been closely identified with the work of this Society. It is not necessary that I should tell you when it was. He was the same self-contained, self-controlled, courteous, kindly gentleman that he is to-day, and it is such men as Dr. Gilmer that have made the profession of den-

tistry what it is. And then I remember another man, a man we are proud to claim a Canadian; a man who is an indefatigable worker, who is the embodiment of extreme modesty, but to whom the dental profession is greatly indebted for many practical, scholarly contributions—Dr. C. N. Johnson. (Applause.) But his greater work has been in connection with the college, and I said to myself, fifty years from now, when he will begin to think it is time to retire from practice (laughter), when he perhaps realizes some of the things he has written are a little out of date, it will not be by that which he has written, it will not be by the operations which he has performed—and these have borne the mark of skilled hands, and a master mind—but it will be by the things he has done in the school, by the inspiration he has given to students, and by the help he has given to the weaker men. God bless the men in all our schools and in all our offices whom success has not spoiled nor eminence robbed of their sympathy. (Applause.) And so I might go on and name others, but suffice it to say, there are men coming up to take the places of these great men who laid broad and deep the foundations of the great profession to which we belong. But what has been accomplished? This has been accomplished, and largely in the United States of America: American dentistry has brought almost to completion and almost to perfection the technical skill which has made dentistry known in every civilized country in the world. (Applause.) That has been the great work of American dentistry, and yet this is the condition: As the profession has advanced, more and more it has been impossible for the common people to obtain the services which these skilled men are able to give them. I am not going to enter into any sociologic discussion, yet go out and ask the men on the street car, the conductor, or the motorman, how much money has he to spend on his wife and family and self to obtain the services of the skilled men who sit in this room to-night? There must be something done, and when your President wrote to me, asking me to speak at this banquet, I confess that I walked the floors of my home for hours wondering, wondering what I could say in view of the awful avalanche of requirements that is coming down like a Niagara upon the prominent people today and sweeping the dental profession from its moorings. But as I walked up and down, there came from this anguish mental, physical and spiritual, a great ray of light, and it came not as I looked forward, but as I

looked backward. It came to me in a flash how the problem will be solved. The achievements of the past are the hope of the future. I said, what has been done? And I thought, small-pox has been robbed of its terror; malaria has disappeared; yellow-fever has practically been stamped out. We are using preventive measures for typhoid fever and diphtheria, and now scarlet fever bids fair to disappear from the terrors of the land. And I said, yes, the time is coming when dentists will no longer stand at their chairs to repair the ravages of disease, but that disease will be conquered; that the National Dental Association of the United States of America has appropriated a sum of money to permit men to take up research work. That is the hope of the future. (Applause.)

We have been trying by municipal clinics and school clinics to stamp out the ravages of tooth decay, but we have only touched the fringe of the thing. Something more must be done in the future. How is it to be done? By this nation standing alone? No. By the philosophic minds of the Germans? No. Not by them alone, but it will be solved, as every other great international problem has been solved that had for its aim some mighty beneficent purpose, by all these nations standing together. I think of one or two instances of national and international importance.

I remember that some years ago there was an uprising in China, and American citizens and Canadian citizens and the citizens of every country in Europe were imperiled. Those who were in rebellion were warned that the person and property of the foreigner must be respected, but no heed was paid to the warning, although it was given time after time, and when forbearance ceased to be a virtue, men were landed from American ships and from British ships, and the men of these two nations marching side by side through the country came to the walls of the Imperial City and demanded entrance. The gates were closed, but they forced their way through the broken walls and side by side the American citizen and British citizen following the Stars and Stripes and the Union Jack went through the gates of the Imperial City and stabled their horses in the Imperial Palace. They taught that nation and with that every nation of the world that England and America stood shoulder to shoulder to respect the rights and privileges and lives of all men of all nations. (Loud applause.)

And so it will be, ladies and gentlemen, in solving this problem

of the welfare of the people. Only dentists themselves realize the magnitude of the problem. Physicians are beginning to awaken to its great possibilities and strange to say, Mr. Toastmaster, I consider the progressive citizen is in advance of the physician in recognition of its importance. But it is coming. America and Germany and Britain and every other civilized country, and last, but not least, a nation perhaps that understands you better, a country north of the great lakes and the forty-ninth parallel of latitude, will stand shoulder to shoulder with you to solve this problem in the hope that the common people will be benefited, and that the things which have been done in the past are but an earnest of the things which the future will bring to full fruition. I thank you. (Loud and prolonged applause.)

THE TOASTMASTER:

Kansas is a noted State that has ever been populated with many noted people. In Kansas there lived a man named John Brown, who, some historians say, did more than any other, except the immortal Lincoln, to stop Slavery and reunite the then dividing North and South. Kansas, the home of John J. Ingals, the author of "Opportunity."

In Kansas, in the little town of Emporia, one afternoon, a man wrote an editorial entitled "What's the Matter with Kansas?" only to wake the next day and find himself a National figure. The writer was Henry Allen White, the newspaper owner and now noted author and Progressive, who but a few weeks ago wrote another editorial which attracted National attention under the title "Why Henry Allen White should not be nominated by the Progressive Party for Governor of Kansas."

Yes, Kansas has ever been known as the home of great and brave men but she has never had a citizen of whom she could be more justly proud than of Henry J. Allen, our guest tonight. (Applause.) He, like Henry Allen White, edits a newspaper, but unlike his brother editor, he has been spending the last few months trying to convince the people of his State that he should be elected their next Governor as a leader of the Progressive Party. (Laughter.) He has received the nomination and I am told he is sure to win. (Applause.) Mr. Allen has been a factor in politics for a great many years, holding office in his City, State and our National Congress as a Republican—but when the last National Republican

Convention was held in the city of Chicago to nominate men for President and Vice-President of this country, you all know, or at least we stand-pat republicans do, that a split occurred in the Republican ranks with President Taft and ex-President Roosevelt leading the opposing forces. When the decision was finally reached by the Progressives to cease all further participation in the affairs of the convention, Mr. Roosevelt and his wisest political lieutenants met to decide who should be trusted with the delicate and difficult task of making the speech of withdrawal of the Progressive delegation. After careful deliberation the choice fell upon Mr. Henry J. Allen, our next speaker, who is not only a good politician, but a Statesman of National reputation, who will now respond to the toast "The Professional Man's Duties as a Citizen." (Applause.)

Mr. Allen was enthusiastically received. He said:

Mr. Toastmaster, Fellow Citizens of Chicago, Ladies and Gentlemen: It is worth coming all the way from Kansas to get an introduction like that. (Laughter.) I want to ask your consideration in this rather delicate personal matter. While you have been enjoying a real banquet, I was thinking of having been taken down to the First Ward by men to make a few but well chosen remarks about an eminent citizen of yours by the name of Bath House John (laughter), and then before I had finished all I had to say about him, I was yanked away again and brought up here, and if I should get part of that speech intermingled with this, I hope you will take no offense, since he is one of your best known officials. (Laughter.) The fact of the matter is, Hinky Dink and Bath House John of the First Ward are the only Aldermen of Chicago that Kansas ever heard of. (Renewed laughter.)

As I stand tonight before this great audience, this most astonishing audience, composed largely of members of a great profession, to celebrate the victories of fifty years, I am profoundly conscious of the inspiration which one might get from a survey of your achievements during that golden period. Fifty years is only a brief time in the life of a nation—only an incident in the life of a great profession. When I witness what you have accomplished in fifty years, I can hardly believe things are real. Fifty years ago teeth were just teeth. (Laughter.) Now, they are health and human happiness. (Applause.) Fifty years ago the profession of dentistry was manual labor; now, it is art and science. Fifty years

ago, when a man had the toothache, the dentist pulled the tooth out, and then when another one ached, he pulled it out. Fifty years ago no dentist had begun to doctor causes. Fifty years ago no medical man was doctoring causes; they were doctoring effects and results. Fifty years ago no dental society had introduced dental clinics in the high schools. No one thought of the simple wisdom of training up a young tooth in the way it should go. (Laughter.) Fifty years ago when there was a suffragist in the world, they did not know what was the matter with her. (Laughter.) Her husband did not know either. (Renewed laughter.) Fifty years ago men did not know as much about human welfare as they do today. The trained nurse had not been accompanying the school teacher. The words "Conservation, occupational training, minimum wage scale, the prohibition of child labor," have been born into the language of statesmanship out of the dire need of civilization. Fifty years ago a bull moose was just an animal. (Laughter.) Wonders have been accomplished in fifty years in this broad land.

Fifty years ago a Frenchman came to America, looked it over, remained here ten days or two weeks, went back home, and in his book stated he had investigated this country very thoroughly. He prophesied there would be no commercial unity in the United States because of the distances which separated our cities. He said Chicago was a thousand miles from Washington; that New Orleans was 1,800 miles from Boston, and there was nothing between them. (Laughter.)

Many years ago an Englishman started for San Francisco, California, after having landed in New York. He got on a train and the next morning, when the train stopped in a shed, he grabbed his hand luggage to get off, and the conductor said to him, "Hold on, hold on, this is not San Francisco; this is Pittsburg." (Laughter.) He went in, sat down, rode all day, and when the train was pulling into a large city, he again grabbed his luggage and started to get off. The conductor said to him, "This is not San Francisco, this is Chicago." (Laughter.) He went back, sat down, tried to get off the next day, and was told by the conductor they had reached Denver. Every big sized town they passed through the Englishman thought it was San Francisco. After another long ride, thinking he had reached his destination, he got up, was on the eve of getting off, when he was told the city they were just reaching was Ogden,

Utah. (Laughter.) The Englishman in his exasperation said, "It is no wonder Columbus discovered America; he couldn't have missed it." (Roars of laughter.)

Fifty years ago it was a longer journey from Chicago to Wichita, Kansas, than it is now from Chicago to Hong Kong. Fifty years ago it was a long and weary journey of weeks from the Atlantic sea board to the Middle West. Now, a man may go from New York to Chicago in eighteen hours, barring accidents, such as the loss of an arm or a foot, or whole set of them (laughter), but men are anxious to save several hours of time in these days at any risk or cost.

Pardon a personal allusion. My grandfather came from Scotland less than fifty years ago. It was a long and weary journey in those days. If a man has the price he may go from New York to Liverpool now in a little over four days in a floating palace with real kings, common millionaires, actresses and pool players. (Laughter.) People living at great distances have become near neighbors. People no longer look; they feel everything. One man stands at the telegraphic keyboard, starts a chord vibrating, and it vibrates from ocean to ocean. This unanimity of thought and action has its purpose. It has intensified popular emotions. It has given purpose and power and direction and results through popular emotion. You can all celebrate a great victory, a victory full of rich achievements in your profession, in every profession, as, for instance, in farming. I was raised on a farm. It may not have been necessary. (Laughter.) I was the humblest thing that had to do with agricultural life. I was the hired boy. I can remember the time when I used to tumble out at four o'clock in the morning in the uncertain light of the dawn, when every bone in my body ached like the toothache, to wake up the stock and say it is time to get up. (Laughter.) I can remember how an impression was made upon my young mind when in milking a provoked cow would wrap her tail around my neck, and may be deposit her left hind foot somewhere. (Laughter.)

Less than a month ago I had the pleasure of standing before a body of students of the State Agricultural College in Kansas. It was a body of more than 3,000 students who are being taught that the greatest thing to use with soil is brains. After I had talked to them in a rambling sort of way one of the professors came to me

and said, "When you are through, I want to take you down to the experimental barn and show you something." I said to him, "I will quit right now." (Laughter.) So he took me and showed me a \$150,000 barn where they teach economic farming. (Laughter.) What do you think he showed me? A milking machine—me (pointing to himself) with those boyhood memories. The fundamental part of it was a gasoline engine. Proceeding from the gasoline engine was a rubber tube, and then emerging from that rubber tube were four smaller tubes, capped with a little suction arrangement. They attached each one of the arrangements to one of the teats of the cow, started the engine, and in less than three minutes they milked that cow so dry that she could not chew her cud. (Roars of laughter.)

Now, they have one of those things over in Canada. This is what we call modern science and art. Through imitativeness it has been made possible by nations not so gifted from an artistic standpoint as ours. (Laughter.) They imitate each other.

The other night I sat in a beautiful hotel in New York; the hour was late, and I should not have been there, but as I explained to Mrs. Allen, I was waiting for a train. (Laughter.) While I was there visiting with some friends a very jolly party came in, and in that party there was a lady with a green hat, green hair, green dress, and green shoes. I said to my friends, for the love of Mike, is it St. Patrick's Day already? They said, "No, that is the new style they brought over from Paris." Oh, how we imitate each other. We catch each other's diseases.

A few years ago an epidemic of yellow fever broke out in Cuba. A great many people contracted the disease, but a great American physician wondered where we were getting all this yellow fever from. Finally he laid it onto a mosquito. He took care of the situation and they have had nothing to worry about since except the bubonic plague which is brought to us by flies and rats from Asiatic countries. By the way, my subject "The Professional Man's Duty as a Citizen," deserves some attention before I sit down. (Laughter.) I never talk a long time, and I am not going to now. I will be through in less than an hour. (Laughter.)

A professional man's duty as a citizen challenges him to do more than ever before. It challenges him to be broad if he happens to be a citizen. It says to the dentist, you will be a better

dentist for being a better citizen. It says to the doctor, you will be a better doctor for being a better citizen. If I should go out to the University of Chicago tomorrow and ask one of the doctors connected with that institution, what is the matter with my arm, the biceps does not rise as it should, that it is flat and flabby, he would say at once, there is no mystery about your arm; all lazy men have such arms. That arm needs training. If I should go to a professor of psychology and ask him what is the matter with my mind, he would say, there is no mystery about your mind; all lazy men have minds like that. You neglect to exercise your mental faculties. It is God's law to utilize and exercise your faculties. It is a law in the physical world. You may go out on the prairies of Illinois and dig and plant all kinds of things, but it is another question whether they would grow. Take the country rose, the wild rose. It would not be much of a flower, although we like to see it, but if I were to take a leaf of that flower to Mr. Burbank and say there is a rose I do not think much of, I want you to take it and make a real rose of it, he would stick it into the hot house, culture it, and graft upon it, and in a little while, bring me back a double leaf, the great American Beauty Rose, the most beautiful flower God ever watered with dew or sunshine. There is your prairie rose. I can take it back to the prairie and plant it where I plucked it before, and in five years it will have reverted to the type of country rose whence it came. That is mind as seen in plant life. That is the law of citizenship. There is no grace of mind or heart that comes to us unasked for or stays with us unexercised. So the goal today for the professional man is that he be a citizen as well as a professional man.

Many times in the last thirty years I have been interested in politics. I have had professional men say to me, I take no interest in politics, which is an admission of recreant citizenship. What is the goal of the dentist and doctor? They use the brain and discipline the mind, and professionally they ought to exert their influence for a better citizenship and stand before the world, first, as great citizens, and next as great dentists or great doctors, whichever it may be. (Applause.) That is the challenge. As I look over this great audience and into the faces of those men who have wrought so well with their great profession, all of my fears for the future are laid away, and I become an optimist, and praying that

my eyes may be made to see, I catch a vision of this great republic, with its mighty forces all in balance, its perplexities solved, its visions straightened and emerging at the head of all nations of the world into the millenium of the dawn of peace and human happiness. That is the goal of the modern citizen, and in the accomplishment of it there is no class so equipped for effectiveness as the trained professional man. (Loud and prolonged applause.)

THE TOASTMASTER:

Before calling upon the next speaker, I desire to inform our ex-presidents that we who have assembled here deem it a proud privilege to be permitted to do honor to you men who have honored us by having been our former presidents, and have by day and by night studied and labored for the best interests of the public and profession. Your names are universally respected in this City, in this State, yes throughout the entire world because of the many valuable contributions you have made to scientific dentistry. I would have you gentlemen understand that we appreciate your worth and I have tried to place this regard in a more tangible form than mere spoken words, therefore, there has been designed and wrought this metal wall trophy and it has been thought appropriate that I should explain to this audience the significance of its construction. (Applause.)

In the right hand lower corner is placed the Seal of the State of Illinois to show the profession's recognition of the State and National Government and for the protection of the home. Directly across in the opposite corner, not above nor below, but exactly opposite, in a similar location to the emblem of the home, we find a study lamp throwing its rays across the year of 1865, the date of our Society's organization, with the thought expressed that consistent study on the part of the members of our profession began with the organization of our Society and has continued through this half century.

Two columns form the sides of our trophy, one resting upon the State and home, the other upon the profession. Upon the face of each pillar is seen the caduceus which stands for science, with the idea portrayed that our profession in its building has endeavored to be scientific rather than Empirical. On the cross beam resting upon the pillars we find opened books for study, the standing closed books for reference, significant of the fact that you men

who have been our former presidents have ever been students and have never been satisfied with your own findings but have always used authoratative reference books, when they could be found. Between the reference books and the shield at the top is seen the torch of knowledge, brilliantly burning, to show our appreciation of your frequent contributions to the profession.

Across the shield forming the top of our trophy we find placed our superior motto "Progress." At the bottom in the center is raised an unfinished pyramid with the thought that there is still unfinished work for the future Officers and members of our Association. The pyramid stands for durability, stability and long life. At the base of the pyramid is found the inferior motto "Harmony" with the thought that although our members have had frequent differences, we have never allowed them to interfere with the progress of our Society nor the welfare of the public intrusted to our care.

We find raised upon the central portion of the trophy the following inscription: "Illinois State Dental Society presented to _____" the former president's name and the year he served the Society in that capacity, and beneath, the statement that the presentation occurred on the occasion of the Society's Golden Anniversary March 25, 1914, city of Chicago.

Ladies and gentlemen as acting president of the Illinois State Dental Society on behalf of our Society, I now have the pleasure of presenting to each of our former Presidents one of these solid bronze tablets on which will be found his name and the year he served the Society as president. I request the following gentlemen to assist me in distributing these gifts: Drs. W. E. Harper, W. T. Reeves, G. W. Dittmar, T. A. Broadbent, W. F. Whalen, C. B. Warner, D. C. Bacon, A. B. Allen, C. E. Meerhoff, L. E. Bake and G. C. Poundstone.

The bronze tablets were then handed to the following ex-presidents:

A. C. Van Sant
G. V. Black
Charles R. E. Koch
Edmund Noyes
Thomas L. Gilmer
*W. T. McGill

Truman W. Brophy
William H. Taggart
E. K. Blair
Garrett Newkirk
James W. Cormany
Charles P. Pruyn
R. N. Laurence
J. G. Reid
M. L. Hanaford
A. H. Peck
*F. H. McIntosh
C. N. Johnson
S. F. Duncan
*Elgin MaWhinney
W. A. Johnston
Arthur D. Black
E. H. Allen
Donald M. Gallie
C. C. Corbett
J. F. F. Waltz

(Applause.)

THE TOASTMASTER:

When the time came to select one of our members to respond to the toast "The Illinois State Dental Society," my mind quickly turned to a man whom I have known well for over twenty years in the City of Chicago; my first teacher in operative dentistry, an earnest, strictly honest dental practitioner, who wins and holds the confidence of all men who grow to know him well, a man with good impulses and a mental capacity of a high order who is honored alike for his true merit, his professional success, his modesty, and for his distinguished ability as an orator. To this type of man, and to this type of man only, should be given the opportunity to respond to the toast "The Illinois State Dental Society." Ladies and Gentlemen, Dr. Louis S. Tenney, of Chicago. (Applause.)

DR. TENNEY:

Mr. Toastmaster, Members of the Illinois State Dental Society, Ladies and Gentlemen: The Toastmaster has alluded to the fact that I was one of his teachers in operative dentistry. It is a fact

*These were not present.

which I also have frequently referred to with much pleasure and pride, but when I tell you that he does not practice operative dentistry, you will know why I wonder if it was my teaching that led him to abandon that interesting work. (Laughter.)

I do not like the complimentary manner in which the Toastmaster has introduced me. It unnerves me. I feel like running away before he has another such opportunity. I feel somewhat like the colored man who happened to be present at a shooting affray. When the case came up for trial the judge asked him to explain how it happened. "Well," said he, "I just heard two shots in quick succession and the man dropped." "Where were you when the first shot was fired?" asked the judge. "Why I was standing right side of the man." "And where were you when the second shot was fired?" "Oh: when the second shot was fired I was over at the Court House." (Laughter.)

The importance of the task with which I have been burdened, and yet most signally honored, the magnitude of the events in which we have had the pleasure to participate during these three eventful days, the talent and the genius, both professional and otherwise, which honors and adorns this gathering, all cause me to wish that the subject "The Illinois State Dental Society," might have been responded to in a manner far beyond any poor and feeble talents of mine.

I look about me and I find myself in the presence of men gifted in the art of oratory, whose voices have filled this hall, and whose words of eloquence have charmed this audience. While all about me also, there sit many of the brightest minds that dentistry has produced, men, who, brushing aside the traditions of the past, have attacked the problems of dentistry with the weapons of science and by these means have raised it to a plane not dreamed of in the early days of this Society. (Applause.)

Let me pay tribute, at this point, my friends, to that man of genius who presides at this banquet table tonight, for such resources as his, such masterly generalship, such executive ability, such an exuberance of ideas, such a combination of rare and diversified talents as he possesses, and all contained within the confines of one little human cranium, I have never met with before, either inside, or outside, or any other side of dentistry. (Applause.)

Members of the Illinois State Dental Society, if you have been

pleased with the events of this day, if the celebration of the fiftieth anniversary of the founding of this Society has come up to your highly raised expectations; if looking about you, you have experienced a conscious pride in the things you have witnessed; if you can return to your homes better equipped for the duties that there await you; then look to the center of this table and behold a man, who during the trying months preceding this celebration has exhibited a spirit that never wavered, a determination that never faltered, an energy dauntless and unbounded, amid labors more difficult and exacting than were ever encountered before in any meeting that was ever held in the history of this profession. (Applause.)

To those of you who live at a distance and have not been in close touch with the progress of this event, such language as this might appear extravagant, but to those who have been close to the field of operation, and particularly those who have been assisting in the work my language contains not one word of exaggeration.

In order that you may understand more fully what I mean, and yet not to dwell upon tedious and unnecessary details, let me merely say, that to inaugurate this clinic along these new and practically untried lines, to call together this great array of talent, to assemble in one place this vast amount of educational material, and to cope with the innumerable details and difficulties incident to such an undertaking as this, has required an amount of labor and judgment and expert generalship, which few, if any of you, can understand. (Applause.) And while our President has been most ably assisted, while he has had gathered about him men who have contributed freely of their time, their thought and their energies, yet these same men will agree with me that through all these trying days, Dr. Logan's has been the master mind. (Applause.)

For all of us he has been the court of last resort. No day passed that he did not take upon his already overburdened shoulders, the load of some weary pilgrim, no day passed that he was not called upon to instill renewed vigor and enthusiasm into some jaded spirit; and as time went on and found us staggering under the burden we were carrying, yet too proud to go down to defeat, we could only turn to this man and exclaim:

“Master, lead on and I will follow thee
To the last gasp, with truth and loyalty.”

And then, ladies and gentlemen, in order that the harmony of his labors might not at the very last be disturbed; in order that difficulties might beset his path right up to the very end, let me say that it required his most consummate genius, and called forth the utmost of his vast persuasive powers, to compel me to come here tonight and botch up this job.

The events of the celebration of the Golden Anniversary of the Illinois State Dental Society are about to pass into history, and he who would adequately respond to such a toast as mine on such an occasion as this, should be fortified with a knowledge of history that I do not possess, should have had a personal acquaintance with the members of this Society more extensive than I have enjoyed, and should have a broader and more comprehensive knowledge than I can lay claim to of those underlying forces, discoveries and inventions that have marked the progress of our profession. It is most fortunate, therefore, that the duty of writing the history of this Society from its very inception to the present day was intrusted to, and has been discharged by men whose long association with the members of this organization, whose intimate knowledge of the factors of its development, and whose close acquaintance with a very large number of those who have been most active in its work has marked them out as being particularly well fitted for this important task. I am glad that their duty has been so well performed, and that in the transactions of this meeting there will be recorded the work of those men whose achievements have made their names known and honored not alone in dentistry, but throughout the whole scientific world. (Applause.)

It is well that this history should be written. We owe it to the men of the past. Their achievements, from the greatest to the smallest, should be duly recorded, for I take it that the object of such a celebration as this is not only to promote those professional relations and to encourage that interchange of professional thought by which alone we are able to make progress, but it is also to commemorate the deeds and signify our appreciation of the work of those who have gone before us. As we review the history of this Society and our thoughts revert to those conspicuous figures whose work and discoveries have blazed the way of our professional growth, it is a matter of general rejoicing that many of those men are here tonight. This is no doubt a pleasant scene for them to witness.

Let them look out upon this Society, one of the largest and most influential of its character in the world, and let them know that in all its departments it bears the mark of their workmanship. They belong to that type of men who have perceived the larger needs of dentistry—who have laid hold of science and appropriated it to our use; who have studied art and applied it to our needs; who have cast the light of science upon our most baffling problems, and who have advanced dentistry to its present position of honor throughout the professional world. (Applause.) We may well pause to pay them tribute. They have brought honor to our profession. They have enlarged the field of its usefulness. They have established it upon a secure foundation. It is well that by fitting words and appropriate deeds we testify to an appreciation of the work they have done. It has been a question in my mind as to what extent this audience might be interested in a recital of some of the more notable achievements of the members of this Society since it was organized fifty years ago and while it would appear most appropriate on such an occasion as this, I must not forget that to the few who are not members of our profession, such a subject might easily become tedious and uninteresting. Without attempting, therefore, to enumerate the great number of inventions, improvements and discoveries that have originated here, I shall briefly mention a few names, and shall mention a few discoveries that have been of such a character as to have effected marked changes in our methods of practice.

I believe that if I were to ask the dentists of this audience what man, in their opinion, has made the greatest impression on our profession, particularly in its broader and more scientific aspects; if I were to ask you what man it is who has been the greatest moulder of dental thought; if I were to ask who it is whose genius ramifies every department of our work, you would, with one accord, proclaim the name of G. V. Black. (Loud applause.) Time will surely not permit me to review the work of this man, nor to even mention the varied problems that have been illuminated by his genius. Merely let me say that his work has been woven into the very fabric of dentistry, and turn where we may we must acknowledge our indebtedness to his scientific researches. As we look upon him now, venerable in years, yet active and vigorous in mind we can only hope that time will yet spare him to those he has served so

long, so faithfully and so well. (Applause.)

In the field of oral surgery our Brophy and Gilmer have taken up the work where Garretson left off, and have pushed it further toward perfection. (Applause.) The operation for cleft palate originated by the former has been adopted extensively, not alone in this country but by many of the most distinguished surgeons abroad, and for the invention of this operation alone, humanity owes him a debt of gratitude.

In the field of orthodontia we turn to Case, and behold, by the magic of his hand we see malposed dental organs restored to their usefulness, and distorted features transformed into lines of beauty. (Applause.) The sweet damsel smiles at his approach, and the anxious parent beams upon him with gratitude. (Laughter.)

Would you care to gaze upon an author, a critic, an investigator, a scholar, an editor, a philosopher, an orator, a teacher, an artist and a poet, all combined in one radiant dignified personality? Then behold our Johnson, whose presence adorns the most learned gathering and whose genius lights up the darkest recesses of our art. (Loud applause.)

In therapeutics we long clung to the musty traditions of the past, until a Buckley came and showed us that here too we must allow the light of science to break in upon us. (Applause.)

His methods, in many respects revolutionary in character, are rapidly being adopted by the profession, and bid fair to supplant all others. (Applause.)

Behold the microscope of Noyes that casts its piercing eye into the very heart of dentistry, and teaches us where, and why and how to proceed. (Applause.) Too few of us, I believe, ever appreciate the work of such a man. We little realize the sacrifices that must be made in order that anything of consequence may be achieved and even then, after years of toil, there is little reward, except indeed, that reward which lies within himself, that reward which comes from the satisfaction of having performed a useful work. (Applause.)

I turn to Goslee, whose nimble fingers and scintillating brain have made mechanical dentistry no longer a drudgery, but a pleasure, a pastime, and a joy. The metals yield to his magic touch and at his command shape themselves into things of beauty and usefulness. (Applause.) The work of this man is known and recog-

nized wherever dentistry is practiced throughout the world. (Applause.)

But what shall we say of Cushing, Allport, Dean and Swain, of Harlan and McKellops, of Patrick, Eames and Crouse, of Cook, Noyes, Laurence and Haskell. What shall we say of Newkirk, Cormany and Hanaford, of Pruyn and Hinkins, of Logan, Gallie and Prothero, of Moorehead and Gethro, of Waltz and Roach, of Whipple and Dittmar—men of the present and past, whose names must ever be linked with that of our Society.

Our records are replete with names that time will not permit me to mention. It is unnecessary that I should do so. They are written in letters of gold on the pages of our history, and it is not in my power if I would to add to or detract from their fame.

There are those who, looking out over the field of dentistry today, would have us believe that we have all but reached the limit of our possibilities. Could there be a greater folly than to say that in any department of our work we have even approached perfection? As well might we say that all the resources of art and science are now exhausted. We know otherwise. The lesson is before us, for when a few years ago it seemed that we might fold our arms with satisfaction and complacency, and proclaim to the world that our work was done; that dentistry had indeed attained perfection; that we had solved its most baffling problems, behold a Taggart came and the whole structure well nigh tottered to its fall. (Applause.) The cast inlay! what magic its name! And what a blessing it has conferred upon us and upon those we serve. The cast inlay! They say it has revolutionized dentistry. I say it has not revolutionized dentistry, it has created dentistry, and when I say that it has created dentistry, I am not blind to the fact that there is a broader aspect to our profession than the mere filling of teeth. Why the President of our Society—and he's a resourceful man—I never knew what a resourceful man he is until I saw him at work upon the details of this clinic—the President of our Society; I want you all to know that he comes from that family of Logans which the soldier and patriot John A. Logan has made immortal. (Applause.) The President of our Society, I say, and other dentists sitting here, never fill a tooth. But they are specialists. I know and you know that the filling of teeth is today, and as far as we can look into the future, must continue

to be a very large part of our work, and when I look back seven years and recall the mental and physical strain we then endured, and then look upon our work today, I repeat that the cast inlay has not revolutionized dentistry, it has created dentistry. (Applause.)

But in speaking of those men whose inventions and discoveries have done so much to improve and simplify our work, I wish to make a remark, which is not intended, however, to detract one iota from their just fame; but I turn to the great rank and file of our profession who toil on, patiently, earnestly, with less display, it is true, but with just as much loyalty as those whose lives have been cast in more conspicuous places, and I say to them that in the vast majority of instances, inventions and discoveries are but the logical outgrowths of the aggregate thought and the average intelligence of the day. (Applause.)

They come because the time is ripe for them, because the minds of men everywhere have long been at work upon the principles which underlie them and such inventions finally come to supply the needs that were perceived, though dimly perhaps, by the great body of workers. (Applause.) It is here that we see the necessity for that harmonious effort, which on the whole has characterized the growth of this society. To bring the minds of many to bear upon our future problems, to glean a fact here, a fact there, it is only by this gradual accumulation of knowledge from widely scattered sources that we may hope to enjoy substantial growth.

In the far northern part of our country there rises a tiny spring, so small that you might kneel, and with a tumbler dip up its outflowing waters. Not far away another spring bubbles forth and mingles with this tiny stream. Soon a little rivulet hurries on to join it in its course. Flowing on, this ever widening stream soon becomes a river, and as it increases in importance the little creeks hurrying down the hillside are proud to add to its growing strength and so it continues, until at length it empties into the Gulf of Mexico, the mighty Mississippi. (Applause.)

From what innumerable sources comes this monstrous stream? More than two thousand miles away the bubbling spring emerges from its hiding place and proclaims that the future giant is born.

The overhanging bough sways in the morning breeze and yields up its moisture. The winter snows melt in the sun's bright rays, and help to nourish it in its infancy. The clouds burst and cast

their contents into its bosom. The giant waterfall pours into it its maddened torrent. From sources infinite in number and variety, it continues to grow, and as it flows majestically towards the sea, even tributary streams, mighty in themselves, yield to its superior greatness, and when at length it is swallowed up by a flood, even vaster than itself, it proclaims a mighty power to which half a continent has contributed. (Loud applause.)

What a miracle! What a miracle it would be if this huge stream should rise at the shore, and burst, full grown, into the sea:

I close by asking the members of this Society to continue in the work they have done so well.

You have all heard of the old dame whose cottage was by the sea. One day a storm arose which raged until the water began to creep into her humble home. In much alarm she seized a broom and began sweeping it back. But it was not long until she discovered that she could not sweep back the ocean, and gathering together what effects she could she hastened to a place of safety.

We live at a time when a vast flood of knowledge is pouring its light in upon us. We cannot stem the tide. We would not sweep it back. Let us then join the educational forces of the day and do our share in the great work. (Prolonged applause.)

THE TOASTMASTER:

It is most appropriate that I should ask the first President of the Illinois State Dental Society to say a few words to you—Dr. Van Sant. (Applause.)

Dr. Van Sant was very warmly and enthusiastically received, and when quiet was restored, he spoke as follows:

Mr. Toastmaster, and Members of the Illinois State Dental Society: This outburst of enthusiasm at this late hour shows how enthusiastic people can be when engaged in a work they deem for the public good.

I wish to return my sincere thanks for the very substantial testimonial you have presented to me as an evidence of your good will to your first president.

The Society was organized not so much for the personal benefit of those who formed it as for the good of the public. It was organized for the purpose of giving higher ideals to all practicing dentists, and to educate the public as to the manner of caring for the teeth.

Thousands of teeth that could have been saved were sacrificed by the advice of physicians, and by the ignorance of many who were called dentists. If a tooth ached the common remedy was to take it out. Physicians used to advise the people to have an aching tooth taken out promptly, and if considerably decayed to have it taken out before it ached.

There were many good dentists at the time this Society was formed, as well as some poor ones. Dentistry was thought to be a great money-making profession that could be easily and quickly learned. For a fee of about \$100 inferior dentists were taking students for three or six months, or possibly a little longer, and sending them out to impose upon an ignorant public. Every community had in it people who had had good work done and who could testify to the benefits of dentistry. There was a demand for dental work in almost every community, and there was little difficulty in getting patients.

When the better class of dentists in Chicago and other parts of the State of Illinois, realized the injury that was being done by incompetent practitioners they thought it time to make an organized effort, more in the interest of the public than for their own good. It was formed with the best of intentions, and a spirit of brotherly love added greatly to the pleasure of those who attended the first meeting. The same spirit of kindness that characterized that first meeting seems to be the actuating and cementing force that has made this the greatest dental society on earth. From a charter membership of forty-nine the membership has increased to thousands. It has done a wonderful work in improving the character of dentistry, educating the people, and giving the world higher ideals of the duties and obligations of dentists. The people must know what they want, and must get what they demand.

As a result of the long continued effort of the Illinois State Dental Society the people of Illinois now have some state protection from incompetent dentists.

The clinics and the way they are conducted at this meeting are something wonderful. The plan is original with the Society, and is certainly the best that has ever been devised. The best methods known have been freely given by men of the highest standing in the profession. These clinics constitute the best post-graduate short course of which I have ever known in any profession or occupation,

and are given with a most earnest desire to benefit the profession. (Applause.)

The men who organized the Illinois State Dental Society desired the better education of dentists and were willing to impart all the knowledge they could to the younger or less learned members of the profession.

Knowledge is one of the best gifts it is in the power of man to make. There is one grand thing about giving away knowledge—the more you give away the more you have left. This may seem like a paradox. But in putting our knowledge into the minds of others we see the facts more clearly, and they become more indelibly impressed upon the memory. When new things are learned the best way to retain them is to tell them to others.

It is late, and I must hasten to a close. I do not want to be in the situation of a school superintendent out in my own state. Immediately after the fire at the Iroquois Theater, a certain school in Nebraska started a daily fire drill, and for a time the principal had the pupils leave the building at the sounding of a fire signal. He finally concluded to save time by having the children recite what they would do in the event of a fire. One day the principal had an early call from the State Superintendent of Schools, and after he had called the school together he said, "What would you do if I were to tell you that the State Superintendent is with us this morning and that he is going to talk to us?" They replied in concert, "We would rise in our seats and go in an orderly way to the nearest aisle, pass down the stairway, go across the street, and give the firemen a good chance to use the hose." (Laughter and applause.) If I talk much longer at this late hour you will probably wish the firemen were here with the hose.

This has certainly been a wonderful convention as well as a Golden Jubilee, not only in the joyous time we have had, but in the lasting uplift it will have upon the dental profession, not only in the State of Illinois, but throughout the civilized world. (Applause.)

Your enthusiasm has astonished me. You have often begun your applause before sentences were finished. It has made me think of a story. A sister in a Methodist class meeting said, "I want you all to pray for me. I am trying to serve the Lord, but I am having a hard struggle. I am beset by many temptations, and

I sometimes fear that I shall fail to reach heaven and shall go to hell at last." A good sister was all ready to start a hymn, and without listening to hear the finish of the sentence she began,

"If you get there before I do,

Wait for me, I am coming too." (Laughter.)

One of the great surprises to me is the energy, the dynamic force of your president. Dr. Logan is not a very large man if judged by his physical proportions, but judged by his executive abilities he is a giant. His influence has been felt from ocean to ocean, from the Gulf of Mexico all the way up to where the British lion guards with jealous eye the frontier of the British possessions. Not satisfied with getting people from all parts of this Union, in spite of the fierce look and awful growl of the British Lion, he kidnapped a Canadian and a number from foreign countries. (Laughter.) The name of Dr. Logan should be changed to "Dr. Dynamo." (Applause.)

I hope this organization may long endure, with ever increasing influence for the good of humanity. It will endure if brotherly love holds sway, and the principles of justice are ever kept in view. Nothing can long endure that is not founded upon the principles of justice and good will to man.

With best wishes to you all, and for the continued success of the Illinois State Dental Society, and the hope that you may long work together in harmony and brotherly love, I must close. (Prolonged applause.)

THE TOASTMASTER:

Before calling on the next speaker, I wish to take this opportunity to pay my respects to the men who have rendered the most valuable assistance in connection with this meeting. I refer to Dr. Gallie, Dr. Buckley, Dr. Whipple, Dr. West, Dr. Grisamore and Dr. Idler. It was through the efforts and hard work of these men that this meeting was created, so pay your compliments to them and not to me. These men have worked in season and out of season—all day and all night, when needed and personally I cannot thank them too much for what they have done. (Applause.)

We have with us a former president of the Society who came from California. He is not going to speak to you, but is going to recite a poem of his own—Dr. Newkirk, of California. Applause.)

DR. GARRETT NEWKIRK, Pasadena, California:

When I went to California I was asked to write something, to give my impressions of that glorious and beautiful State for the Mid-winter number of a local paper, and I tried to do it. I also tried to think there were other sections of the country besides California. The Pacific is great, the Atlantic is great, the North and South are great, but the greatest of all is the great center in which we are holding this meeting. (Applause.)

Dr. Newkirk then recited the following poem:

" 'TIS TRUE—AND YET."

Is this new world a real thing?
Are all these wonders what they seem?
Or is this vision of the spring
The strange creation of a dream?

For here no Arctic winds explore
The crannies of each frail abode,
No fiends are shrieking at the door,
Nor piling drifts along the road.

The skies are most divinely fair,
And golden fruit will ripen soon,
While star-like blossoms make the air
More fragrant than an Eastern June.

The Old Year dying only smiled
With benediction of the sho'rs;
The New Year like a happy child
Appears with pageantry of flow'rs.

AND YET

Yet hardly weaned in truth am I,
From frozen milk, so purely white,
That falls like manna from the sky,
And glorifies yon mountain height.

I know the race from which I sprang
Was buffeted by wind and storm,
Where Thor his massive anvil rang,
Besides the glacier's threat'ning form.

I know that mighty men of eld
Were nurtured in a frosty realm;
And rulers of the ocean held
Their hands upon an icy helm.

I love this fair and beauteous land
Where winter shows a smiling face;
From mountain wall to ocean strand
It is a goodly dwelling place.

And yet the truth should not be lost,
The world hath need of sterner fields,
Whose soil, deep furrowed by the frost,
A virile manhood surely yields.

(Loud applause.)

DR. JOHN P. BUCKLEY:

Ladies and Gentlemen: I assure you, if I were to ask the Toastmaster for the privilege of speaking on this occasion, he would say, "no: it will interfere with my plans." So anticipating his answer in advance I shall not ask him.

There comes a time in the life of every individual when in order to do the greatest amount of good it is necessary for that individual ever to be on the alert; to grasp and grapple with the opportunities that are presented. There comes a time also in the history of every organization; yes, in the history of every nation,—when, in order to accomplish the most and achieve the greatest success, it is necessary for that organization or nation to have men at the head on whom it can depend and in whom the utmost confidence can be reposed. When men are placed in these trying positions in life, they are anxious to know who their real friends are, for it is to them that they naturally turn for counsel and advice. Strange as it may seem, it is not always an easy matter to determine one's friends. Occasionally we meet men in the world whom we may regard or consider as our friends; but who, when measured by the true standard of friendship, fall far short of the mark. Others, I am pleased to say, remain true and faithful to the end. I have said before, and I want to repeat it tonight, that personally I would prefer a plain coffin without a flower; a funeral without a eulogy, than a life without my friends.

In the dark and dismal days of the Revolutionary War, when men were discouraged and disheartened, Dr. Joseph Warren endeavored to send sunlight to the hearts of the men when he said, after being warned of the danger to which he was exposing himself, "Sweet and fitting it is to die for one's country." The next day he was killed on the battlefield of Bunker Hill. When Grant was told during the Civil War that he was proceeding along the wrong line and would never meet with success, with his determination he said, "We will fight it out on this line if it takes all summer." (Applause.)

Surely the President of our Association must have subconsciously said to himself, shortly after beginning his professional career, "Right and proper it is to work for one's profession;" and when in a committee a few months ago almost every man agreed that the plan presented by Doctor Logan was great and beautiful, but that it could not be carried out to a successful issue because it involved too much work, he was not disheartened; when he and I left the committee meeting and I tried to convince him the majority in that room were right and that he was wrong, he turned to me and said, with that determined look of his, "John, that plan is going through if I have to close my office and do all the work myself." (Applause.) This man has not only closed his office, neglected his family, neglected his practice; but he admittedly forced several of his friends to willingly do the same. (Laughter.)

As a token of the esteem, the high regard and friendship which this man holds, I have the pleasure tonight, on the behalf of the officers and committees of the Illinois State Dental Society, to present to him a beautiful ring, consisting of a sparkling stone, set in pure platinum. The diamond symbolizing his brilliant career; the platinum his tenaciousness and courage. Dr. Logan, your unswerving fidelity to a trust; your absolute fairness in all you have undertaken, and with all whom you have dealt, has proved to us (though proof, Sir, was unnecessary) that the honor of being President of this great Society has not on you been undeservedly bestowed. "Like wild roses strewn by the lavish hand of the wind to beautify and adorn waste places," the record which you have made during the past year as an executive officer will stand as the highest ideal; toward which we shall all endeavor to reach, and by means of which we can all, in the years to come, measure our own success or failure. (Applause.)

In handing you this ring, although realizing the hour is late, I want to say that when a boy on the farm, like Mr. Allen, I used to take every advantage of every opportunity of standing with my face toward the South, where I could observe the sun at its meridian height, the beauty and glory of the day; and then with intense interest would I follow its course westwardly until, with dazzling brilliancy, it set in the West, and as it went down, I loved to see its departing rays shedding a golden light upon the western slopes of our hills and prairies; for then it was that every blade of grass, every flower, and every vine looked heavenward with thankfulness, not alone for the brilliancy of the ray, but because they realized that by its sustaining influence they were permitted to live, to grow and to develop. (Applause.)

Dr. Logan, your hair, sir, is lavishly strewn with grey; your shoulders have a slight tendency to stoop; your step is just a trifle slower, and whether you realize it or not, you stand today at the meridian of life; and as you go down the western slopes of the hills of life and gradually approach the sunset, your many friends in the dental profession, and in the State of Illinois who constitute the entire membership of this Society, desire sir, that you shall wear this ring; with the hope that the brilliancy of the stone, the purity of the metal, and the significance of the engraving thereon, will serve as a constant reminder of the love and friendship of your many friends in the dental profession. And now, sir, on their behalf, I present you this ring, and I wish you, your loving wife, and darling little daughter God's choicest blessings throughout, we trust, long and useful lives. (Loud and prolonged applause.)

After the applause had subsided, Dr. Logan arose and said, "Dr. Buckley: There is not much one can say, only to thank you." (Loud applause.)

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science,

PUBLISHED MONTHLY.

EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

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EDITORIAL.

THE EUROPEAN MEETINGS.

The Editor of the DENTAL REVIEW went to Europe in July to attend the meetings in Paris and London. In the former city there convened the European Orthodontia Society, and the American Dental Society of Europe. They were held the same week, and both were very successful. Good papers were read and much was added to the sum of dental knowledge. The last day which was devoted to Clinics at the *Ecole Dentaire de Paris* was interfered with by the breaking out of war, but by this time the papers had all been read and discussed.

The proceedings of the American Dental Society of Europe will appear in the DENTAL REVIEW as soon as they can be forwarded from Europe—the war having made such matters somewhat uncertain. When they arrive they will prove worthy of the best traditions of this splendid society. The banquet brought together a notable gathering and it proved a great success, though among those present there was naturally an undercurrent of anxiety on account of the threatening developments of the war. After the main program of the banquet had been concluded the President, Dr. W. S. Davenport, alluded to the imminence of war and feelingly touched on the seriousness of the situation. There was tension everywhere.

On the evening of July 25th, the Editor of this journal was tendered a banquet at the Cafe de la Paix at which there were present many of the most distinguished men of the profession abroad, and some from America. His sole object in referring

to it at this time is to make suitable acknowledgment of the honor, and to a pay a debt which is long overdue. It had been his intention to make a call on each of his confreres in Paris who had so signally entertained him, to express in person his appreciation. But in the twinkling of an eye he was "catapulted" out of Paris by the war, and his thanks were left unsaid. It is with the idea of making some small reparation that the matter is mentioned here.

It may be said in passing that the circumstances of his escape from Paris and later from London will be dealt with in detail in a series of articles just started in The Editor's Desk.

The meetings in London, as might naturally be expected were seriously interfered with by the war. The two meetings affected were the International Dental Federation, and the Sixth International Dental Congress. The first body convened on Monday, August 3, at the University of London, and while the routine business was carried out it was plainly evident that the conspicuous number of absentees would interfere with the usual success of the Federation, and later of the Congress into which the Federation was to be merged.

By the time the Congress opened the seriousness of the war situation prevented many of the old reliables who had gone to London from attending the meetings. The officers did their best under trying circumstances, but even the most earnest workers among them became convinced of the futility of attempting to carry out the program in its entirety, and the Congress finally adjourned before its scheduled time. Our sympathies are hereby extended to our British colleagues, who naturally had so much at stake, and on whom fell the chief burden of the disaster. And yet it must also be remembered that there was some hardship on the American and Canadian contingents, who had spent their means to go to Europe to attend the meeting and had been prevented by the situation. It was a trying time for everybody, and may the hope be expressed that never again in the history of the world will scientific meetings be interfered with by such an appalling spectacle as we see in Europe today.

It was the expressed wish of the Committee of Organization that the Congress be renewed in England in 1916, if the circumstances connected with the present great war will permit such a consummation.

One item of interest to Americans was the election on the last day of Dr. Truman W. Brophy of Chicago to the Presidency of the International Dental Federation, the official body which has charge of International affairs during the ensuing five years till the Seventh Congress convenes.

THE EDITOR'S DESK.

ABROAD IN WAR TIMES.

Another Vacation Story.

None of our party had been to Europe before. I make this confession in the utmost embarrassment and humiliation. Most of our friends had been there—some of them so many times that they were in the habit of speaking of it in the most matter-of-fact way as if it were merely an incident of every day life. I had begun to grow sensitive on the point and edged off the conversation to another topic whenever Europe was mentioned. It mattered not that we had traversed the North American Continent, that we had been to Australia and New Zealand, with Honolulu—glorious Honolulu—Fiji, Rarotonga, and Tahiti thrown in. It was all as naught, apparently. Europe seemed to be the sole essential. Whenever the subject of Europe came up and they caught me before I could side-track them it was always something like this: "Do you recall that mummy in the British Museum?" etc., or "How long ago was it that you were in Paris last? And what did you think of that little restaurant just off the Rue de Rivoli?" or "How did you enjoy Potsdam?" or a lot of observations on the Matterhorn, or the Jungfrau, or the Simplon Pass, or Venice, or Naples, etc., etc., till in sheer mortification I was obliged to head them off and tell them that I had never been to Europe. "*What!! Never been to Europe!!*"

Henceforth and forevermore I could never look that particular individual in the face again. Naturally I became morbid about Europe, and confidentially it was mostly to cure this morbidity that I resolved to go to Europe. It was not that I really wanted to go—in fact I would much rather have gone many other places. Somehow I was positive I should not enjoy Europe, and as the time came I actually dreaded the trip. But there were certain

considerations which made it necessary for me to go; one—the fact that there were others than myself to consider and whose pleasure was more to me than my own; the other—that I was determined to remove forever the stigma that I had never been to Europe. The latter consideration, I am free to confess, was not a very laudable one, but I have pledged myself to write the exact truth, and let the reflection fall where it may. So one day in July



S. S. Emperor.

we took the train for New York, and boarded the Steamship Emperor.

What shall I say of those last few days before leaving home? The pressure of preparation, the nervous tension which invariably comes to a man just previous to a vacation after months of the most incessant application, the foolish apprehension all the while

that something dreadful is to happen and interfere with the trip—a street car jump the track and injure some member of the family, or the house get on fire and prevent us going. All of which is of course a morbid imagination due to over-wrought nerves. The minute I am on the train everything is changed—no more apprehension, no fear of anything happening. The world is brightened and I am enjoying the fullness thereof.

The *Imperator* has been so frequently described that everyone must be reasonably familiar with her, and yet a few statistics may prove interesting. She is 919 feet long, 98 feet beam, and 52,000 tons. It is 250 feet from her keel to the top of her mast, and if she were stood on one of the streets of Chicago she would look like an attenuated skyscraper. Some idea of her length may be imagined when it is stated that if it were possible to squeeze the *Imperator* into State street, with her propeller at Washington street, she would reach up past Madison street, past Monroe street, and poke her nose within eleven feet of Adams street. She would surely cause a stampede down South State street if she ever got headed that way. In the language of one lady who looked at her: "I don't see how the water ever holds her up."

There are six decks devoted to cabin accommodations, with elevators running between them. More than 10,000 electric lights supply the ship with illumination. Not the slightest conception of her magnitude can be had from a written description. Four and three-quarters times around one of her promenade decks makes a mile, and I know of no more invigorating walk than this on a fine morning in mid-ocean.

And then every essential of comfort and luxury is on board. In addition to the several dining rooms there is an elaborate Ritz-Carlton restaurant, with all the accompaniments of a first-class hotel. The social hall or ball-room measures 55 by 75 feet and is equipped with stage for theatrical performances. The walls of this room are decorated with Gobelin tapestries, and the effect is rich and expansive. To be seated in this spacious hall listening to a concert, or watching the dancing one can never imagine that one is on a boat. There was music all over the ship, with a concert, dance or some entertainment every night.

No one need lack a bath on the *Imperator*. There are 229 regular baths and showers in the first cabin alone, including 146

private bathrooms. But probably best and most unique of all is the Roman Bath or swimming pool. Situated amidships and decorated with marble and bronze Roman pillars and ornamental cascades with running water, the effect is luxurious in the extreme. Connected with the pool there are Turkish, electric and steam baths, with rest rooms, sofa, couches, etc. The main pool is 40 by 65 feet, and the maximum depth seven feet. The sea water in it is



Social Hall and Ball Room S. S. Imperator.

being constantly renewed, and there surely is no more refreshing experience than to take a swim in that pool every morning. The slight movement of the ship gives a roll to the water much as if one were swimming in the waves of the ocean. I usually got up early in the morning and took my swim before other people were stirring which gave me a wonderful sweep of the tank. It was glorious.

Then there was the gymnasium located on one of the upper decks and equipped with all the modern apparatus for exercise of every kind such as punching bags, artificial rowing, artificial horse-back riding, etc. It would seem as if no detail of comfort and luxury had been omitted in the building and equipment of this ship, and a volume might easily be written on it. But I must hasten on to a description of the trip.

We had on board, with passengers and crew a total of 4053, which would make a reasonably fair sized town in itself. On the trip over one of the steerage passengers died and was buried at sea. This resulted in a peculiar misfortune to a friend of mine. It was the custom to get up a pool on the daily run of the ship, betting on the number of miles she would make in twenty-four hours. On this occasion there was about \$800.00 in the pool and my friend had drawn 543. That is if the ship ran 543 miles he would get the pool. In burying the passenger that night the ship slowed down sufficiently to lose about two miles, and the log showed



Roman Bath, S. S. Imperator.

541 miles, so that the burial of a passenger cost my friend \$800.00. But that is the fortune of men who gamble. While the passage was free from storms and very delightful, we were not devoid of excitement. The first night out a fog swept down on us and the shriek of the siren cleaved the air like the scream of a mammoth bird in distress. I never knew how thick a fog could be. It sifted in around the decks, and bathed our cheeks in a velvety moisture. Outside there was nothing but a gray bank, and the ship seemed enveloped in chilly steam. But fortunately a fog in July does not usually last long and we were soon out of it.

Later that night I was standing on the starboard side of the deck near the forward cabins where our steamer chairs were, when I saw two of the crew slipping along stealthily toward the companion-way with a hand grenade. The moment they reached the stairs where they thought no one could see them they excitedly dashed up the steps, and I could hear them tearing along the upper deck. I thought I knew what that meant, but said nothing for the moment through fear of alarming my family. But I watched. Suddenly I saw a crowd rushing amidships, and on going back we found the beautiful Ritz-Carlton restaurant on fire. They have a regularly organized fire department on the *Imperator*, and it was interesting to watch them at work. But it was a sad sight to see the ceilings and walls ripped open and the water flooding the floor. It was a stubborn blaze caused by two electric wires crossing, and several times after they apparently had it under control it would flash up again. I do not suppose I would shine as a fire fighter on board a ship, but it occurred to me as I saw those wires sizzling between the ceiling walls that the logical thing to do would have been to turn off the current in that circuit. In fact it was only when this was done, after nearly a half hour's fruitless attempt with the hose, that the fire was controlled. The Ritz-Carlton was a mess. Wreckage was strewed everywhere, and the floor was flooded. Bucket after bucket of water was thrown out across the promenade deck to keep articles from floating around the room. but finally with a big force working they got it bailed out and cleaned up. By morning a miracle had been wrought and the room brought back to a very presentable appearance, though a close scrutiny would disclose the veneer of paper and canvas over the sad havoc made in the walls.

Many of the passengers were fearful lest the report of the fire would reach our friends on shore and unnecessarily alarm them, but the officers of a ship may always be depended upon to minimize the likelihood of danger in reports of such occurrences. Of course we were never in the slightest jeopardy, but if the same fire had started later in the night and on one of the lower decks there might have been another story to tell. It will be recalled that the *Imperator* had a quite serious fire when lying at dock in New York harbor, whereby one of the officers lost his life, but the lack of perturbability on the part of the crew is well illustrated

in the following incident: It would naturally be expected that after these two fires the ship's company would be alert to any possible danger of this sort, but a day or two later I had occasion to learn that at least one of them was not. I had noticed every morning that a quantity of cinders had sifted through the ceiling and covered the wash basins in our staterooms, but thought little of it till one day I happened to be sitting in the room and a live coal fell from the ventilator in the ceiling and began to scorch the carpet. I put my foot on it and immediately began to figure on the possibility of such a thing occurring when no one was in the room and particularly if the coal should chance to fall on a piece of paper. So I reported the matter to our cabin steward, and I had every reason to believe that he would at least be interested in it. But he wasn't. "Oh!" said he, with the greatest indifference, "that is just the way the wind blows." "But," I said, "supposing no one had been in the room, and that live coal had fallen on something inflammable?" "Oh, that's nothing," he answered, "when the wind is in a certain direction it blows the cinders through the ventilator." And that is all the rise I got out of him.

Later during the voyage we ran into other fogs which lasted longer than the first, and it was customary for us to go to bed with the song of the siren in our ears. And I know of no more dismal sound than that in the dense darkness of a foggy night. In the midst of one fog the *Imperator* swerved in her course so suddenly as to almost lay on her side. The cause was revealed in discovering another ship dead ahead in her course, and it was really a close shave. The boat proved to be the *New York*, and later in Europe a passenger who chanced to be sitting near the stern of the *New York* told us that it was a terrifying sight to see that big leviathan the *Imperator* suddenly loom up out of the fog as if she were surely going to put one of her front paws on the smaller boat. The craze for speed should be curbed during a fog at sea, and yet as a matter of stern fact it is not so much the fault of the officers of a ship or even the owners of the line that our vessels take such chances. No boat owner or captain wishes to place in jeopardy the lives of the passengers or the property of the company, and it never would be done were it not for the pressure brought to bear on them by the passengers themselves in their insatiable craze for speed. I do not mean that any given number of passengers on any

ship urge the captain to greater speed—in fact most of them would gladly run more slowly in a fog—but every captain and every owner knows that the ship which makes the best time is the one to be patronized the most. Modern tendencies have developed among our people an unholy desire to accomplish things in a hurry. It is a mad rush every day—a scramble to see who will get to the goal the quickest, not the one who will get there in the best condition. And no one man or set of men can stem the tide. The frenzy for speed has woven itself into our whole social fabric, and he who would take life easily and sensibly is trampled over by the multitude and left in the discard.

The reason that boats run too fast for safety between America and Europe is because many men foolishly consider it a waste of time to spend a few days more on the water, and so long as the demand for speed continues so long will companies be found to cater to it. It is the people who dictate after all, and in this matter of speed the blame should be placed where it belongs. Not that steamship companies are always blameless for loss of life. They take needless chances in sending passengers to sea in unfit tubs which somehow or other get past the government inspection. They overcrowd their boats through greed of gold and thus place in jeopardy the lives of thousands. They take a chance with fate, and usually it must be said they win, because the list of fatalities compared with the number of people who travel by boat is very small, but once in a while fate takes a turn and the world is appalled by the terrible loss of life.

In some instances accidents happen which apparently could not have been prevented by human foresight, but in other cases the blame may be definitely and clearly laid to human avarice or human neglect. The world has not yet sufficiently advanced to place humanity on a basis of mutual protection, unselfishness, and respect for the rights of others, and when it does advance to this point the traveling public may proceed with greater confidence, pleasure and security.

C. N. J.

(To Be Continued).

BOOK REVIEWS.

PROSTHETIC ARTICULATION. By George Wood Clapp, D. D. S. 251 page, cloth. Profusely illustrated. Published by the Dentists' Supply Company, New York.

This is a clear and concise treatise on the principles and technique of the Greene-Supplee method of taking impressions, and the Gysi method of articulation, with the Williams' tooth forms. It deals with such subjects as Impression Taking, Selecting the Forms and Sizes of Teeth, the Colors of Artificial Teeth, Selection of an Articulator, etc., etc. Dr. Clapp writes in a plain, direct way which may be readily followed by every reader, and the book is so amply illustrated as to render the task of understanding the text very easy. Of these illustrations there are nearly two hundred, and they are excellently made.

The book will be especially useful to that growing class of practitioners who are interested in the most modern methods of constructing artificial dentures which, in addition to being pleasing in appearance, are serviceable in mastication; and we commend the book as a most helpful guide in this direction.

TRANSACTIONS OF THE EUROPEAN ORTHODONTIA SOCIETY. Sixth annual meeting held in London, May 11 to 14, 1913, 330 pages. Published by the "*Oesterr-Ungar Vierteljahrsschrift für Zahnheilkunde*." Wein.

This is the first time the transactions of this splendid society have been published in book form, and the result must be very gratifying to all concerned. The book is issued in German and English on opposite pages, and the excellence of the work reflects credit on the publishers. It is a revelation to the reviewer to note the exceptionally good work this Society is doing, as revealed in its transactions and it is only one more indication of the rapid strides of orthodontia, and of the development of the science in all parts of the world. We wish particularly to congratulate the publication committee on the results of their labors, and the success attending their efforts in getting out the present volume—a success rendered all the more noteworthy because of the difficulty involved in bringing out the proceedings in two languages.

DENTAL JURISPRUDENCE, an epitome of the Law of Dentistry and Dental Surgery. By Elmer D. Brothers, B. S., L.L. B Professor of Medical and Dental Jurisprudence in the University of Illinois, and Lecturer in John Marshall Law School, Chicago. 220 pages. Price, cloth, \$2.00. Published by C. V. Mosby Co., St. Louis, 1914.

Here is a book written for practitioners for the express purpose of informing them on their precise relationship to the public, and the legal responsibility involved in conducting a practice. It is the most satisfactory work of the kind that has ever appeared on the subject in one important respect—it is brief and to the point, and is evidently written for the dentist instead of the legal practitioner. In other words it is understandable by those who may not chance to be versed in legal lore, and it is therefore most practical. No student should go out to practice without having read this book, and no dentist who is already in practice should fail to make himself familiar with its contents. It is a pleasure to recommend this work most highly.

DENTAL RADIOLOGY. By Francis LeRoy Satterlee, Jr., A. M., D. Sc., assistant to the Professor of Physics, Chemistry and Metallurgy; Lecturer on Physics; Lecturer on Radiology; Director of Practical Physics Laboratory; Director of X-Ray Laboratory; Chief of X-Ray Section of the Clinic; New York College of Dentistry. 197 pages. Published by Swenarton Stationery Company, New York.

This book is intended as a text book for the under-graduate dental student to be used in the laboratory and while attending clinical lectures. To this end blank pages have been inserted between the chapters for taking notes, thus making the book more practical for study. It contains many useful suggestions for the beginner and even the experienced X-Ray operator may be benefited by its perusal. This is particularly true of the cautions suggested against undue carelessness in the use of the X-Ray—a carelessness which is sometimes unfortunately brought about by too much familiarity with the apparatus. Long usage seems with some individuals to dull the sensibilities of the operator to the dangers which must always exist in the careless use of the rays, and this book presents a timely warning. As a good natured suggestion, not intended to be critical, we would urge the author in future

editions to make a more limited use of italics and capital letters in his text. Italics and capitals are sometimes necessary and serve an admirable purpose in their place, but to use them too freely is to minimize the effect of an argument, and to mar the page.

We wish the author and publisher success in the distribution of the work, which may be of great benefit to the profession.

A TEXT-BOOK OF GENERAL BACTERIOLOGY. By Edwin O. Jordan, Ph. D., Professor of Bacteriology, in the University of Chicago and in Rush Medical College. Fourth edition thoroughly revised. Octavo of 647 pages, fully illustrated. Philadelphia and London: W. B. Saunders Company, 1914. Cloth, \$3.00 net.

While this book was ostensibly written for medical students yet it has a keen interest for the dentist, and even for such varied interests as household economy, sanitation and, to go still further, for agriculture. In fact the subject of bacteriology enters most vitally into every walk of life—even into the progress of modern warfare. The author modestly disclaims any attempt at completeness or thoroughness, and yet it must be acknowledged that a mastery of this volume will place the student in a fair way toward a working knowledge of the entire subject. It is a great pleasure to endorse the book for all who are interested in bacteriology.

A MANUAL OF NORMAL HISTOLOGY AND ORGANOGRAPHY. By Charles Hill, Ph. D., M. D., Professor of Histology and Embryology, Chicago Veterinary College, formerly Assistant Professor of Histology and Embryology, Northwestern University Medical School, Chicago. Third edition thoroughly revised. 12mo of 483 pages, with 312 illustrations. Philadelphia and London: W. B. Saunders Company, 1914. Cloth, \$2.25 net.

The author of this volume has availed himself of the benefits to be derived from suggestions of teachers who have used his book in its previous editions, and he is broad enough to have made improvements in the third edition which seem desirable after the experience of a practical test in the class room. After all—the real value of a book lies in the impressions it makes upon the student, and in the accuracy of its teachings after being tested out.

The portion of the book of greatest interest to dentists is

Chapter IV on the Digestive System—dealing as it does in some detail with the mouth and teeth. Plates II and III are taken from our own Dr. F. B. Noyes, as well as many other illustrations. The prominence given this part of the work by the author is in direct accord with the acknowledged inter-relationship of the general subject of histology with the minute histology of the mouth and its associated structures. The press work and mechanical makeup of this volume are exceptionally well done, and are a credit to the publisher.

A MANUAL OF PRACTICAL HYGIENE. For Students, Physicians and Health Officers. By Charles Harrington, M. D., late Professor of Hygiene in the Medical School of Harvard University. Fifth edition, revised and enlarged by Mark W. Richardson, M. D., Secretary to the State Board of Health of Massachusetts, in collaboration with the following officials connected with the Massachusetts State Board of Health: W. H. Clark, Chief Chemist; X. H. Goodnough, Chief Engineer; William C. Hanson, M. D., Assistant to the Secretary; Hermann C. Lythgoe, Chief Analyst of Food and Drug Department, and George H. Martin, formerly Secretary to the Massachusetts State Board of Education. Octavo, 933 pages, with 125 engravings and 24 plates in colors and monochrome. Cloth, \$5.00 *net*. Lea & Febiger, Publishers, Philadelphia and New York, 1914.

This is one of the most intensely interesting volumes that has come into the hands of the editor in many a day. It is not particularly intended for dentists nor for physicians, but for humanity. Such a work should be read by every legislator, every manufacturer, every employer, every professional man, every army officer, every builder, every householder, and every sociologist, in the land. It is not only readable, but it is compelling. It is full of facts, but not dull facts. If the principles laid down in this book were understood and the suggestions fully carried out it would make the world a vastly healthier and happier place in which to live. It is manifestly useless in the confines of an ordinary review to deal with the various subjects treated in this large volume, but it may be said that it takes in the entire range of sanitation, both community and personal. It deals with the value of the various food materials, the

question of drinking water and its pollution, of sewage and its disposal, of infection and its control, and in fact of all those important health problems which confront humanity today as they have confronted humanity from the beginning. The work is Educational in the highest degree and should have a place in every home.

LOCAL ANESTHESIA IN DENTISTRY. WITH SPECIAL REFERENCE TO THE MUCOUS AND CONDUCTIVE METHODS. A Guide for Dentists, Surgeons and Students. By Professor Dr. Guido Fischer, Director of the Royal Dental Institute of the University of Marburg. Translated by Dr. Richard H. Riethmüller, of the Dental Department of the Medico-Chirurgical College, Philadelphia. Large octavo, 244 pages, with 115 engravings (mostly colored) and 2 plates. Cloth \$4.00 net. Lea & Febiger, Publishers, Philadelphia and New York, 1914.

The impression made upon the profession by the introduction of the present method of local anesthesia lends a particular interest to this volume. The methods introduced chiefly by Braun, and adapted to dental practice by Fischer, has claimed the attention of dentists more prominently than has any previous system of local anesthesia. The translator, Dr. Riethmüller, has done his work exceedingly well, and has at various points amplified the original text with valuable suggestions of his own. One single sentence of his in the preface gives the keynote to his attitude toward the technique of the subject, and it is worth repeating and emphasizing: "As in all dental operations, uniform and unmarred success can reasonably be expected only when full consideration is given to the physiological and anatomic premises upon which the methods advocated are based, and if the exacting requirements of asepsis are rigorously observed in the minutest detail."

This preachment should be pasted on every outfit designed for local anesthesia, and should be grounded into the consciousness of every practitioner employing the method.

Of the various agents used for local anesthesia in the past the choice of the present author seems to fall chiefly on the combination novocain-suprarenin. It is claimed and practically admitted by all, that novocain is much less toxic than cocain, and the addition of a slight quantity of suprarenin is said to lend efficacy and intensity to the solution. To quote from Braun in the present

volume: "The combination of novocain and suprarenin, and the behavior of these two drugs toward one another, is of great advantage in local anesthesia, inasmuch as only very small quantities of suprarenin are needed to intensify the local anesthetic action of novocain to as high a degree as is peculiar to cocain-suprarenin solutions."

The colored work in this book is a great aid in following out the technique, and the whole book forms a reliable guide to the practice of local anesthesia. A very excellent article of little more than two pages on "The Operator's Responsibility," is well worth all the book costs. The English speaking profession is greatly indebted to Dr. Reithmüller for his painstaking translation, as well as to the distinguished author, Dr. Fischer, for his exhaustive labors in bringing out the original work.

CORRESPONDENCE.

Chicago, Aug. 5, 1914.

Dr. C. N. Johnson:

Editor of the DENTAL REVIEW.

Dear Editor:

I note in the report of the committee on nomenclature of the American Institute of Dental Teachers an objection to "exodontia." To get it clear at the outset I purposely omitted saying the "word" exodontia, for if the new combination does not express an idea or a sign of an idea it is not entitled to the dignity of being termed a word. About this what the honorable committee has to say is very interesting but not very conclusive.

The gentlemen have analyzed the word and come to the remarkable finding that the definitions of the Greek root "Odon" and the prefix "ex" give a very unsatisfactory combination. I wish to say that from a great deal of work in word analysis I have found that many words considered in perfectly good usage today, if analyzed and literally defined would appear, as usage defines them now, to have gone a great way from the original meaning. Usage and a demand for new terms creates our vocabulary. I think there is a demand for a succinct word that expresses the idea "extraction of teeth."

To Dr. Geo. B. Winters, of St. Louis, belongs the honor of coining exodontia, and it is emphatically a word for it is truly the sign of an idea. What exodontia implies is as easily understood as is the case with prosthodontia or orthodontia. The latter term has become through usage so well understood that the laity use it in common conversation as easily as dentist. Please analyze dentist the same way the committee analyzed exodontia and what is the answer?

Please let us have exodontia, or we will take it!

Yours truly,

C. F. B. STOWELL.

PRACTICAL HINTS.

Edited by J. E. Schaefer, D. D. S.

(This department is for busy readers. We want short articles containing practical hints—the shorter the better. No article must exceed 200 words, unless of exceptional merit. Every dentist has some useful hint that has been of value to him, and if he will only put it in print it may be of equal value to others. That is what this department is for. Due credit will be given for every article sent. Address J. E. Schaefer, 1745 W. Harrison St., Chicago, Ill.)

Root Canal Foramina:—The roots that have but one foramen are quite in the minority. This fact must be reckoned with in introducing a pulp canal filling.—*Elmer Best, D. D. S., Minneapolis, Minn.*

Lack of Soreness no Indication of Perfect Root-Filling:—The fact that a tooth has no soreness after a pulp canal operation is completed is not an indication that a good operation has necessarily been completed.—*Elmer Best, D.-D. S., Minneapolis, Minn.*

To Prevent Injury to Gum:—To prevent injuring the gum and therefore painlessly prepare an anterior root for a porcelain crown where it becomes necessary to grind under the free margin of the gum, break the points off of a steel pen and grind a half round notch in it. By the use of this in a pen holder it can be placed against the root and the gum held back.—*Dr. C. W. Stuart, Chicago, Ill.*

Melting Aluminum:—In melting the aluminum previous to casting, new clean ingots should always be used. The metal should never be overheated, and, when fusing should be slightly agitated with the end of an ordinary slate-pencil from time to time, and all dross removed, until a smooth, clean surface presents, after which the casting should be made, observing only moderate speed in doing so, as the metal remains liquid for some moments.—*H. J. Goslee, D. D. S., Chicago, Ill.*

No Permanent Antiseptic Root Filling:—There is no such a thing as a permanent antiseptic root canal filling. It is only a catch phrase used by the manufacturers of root canal filling material to sell the material. If dentists would learn to fill roots not with this zinc oxid formaldehyde paste, but with some kind of gutta-percha or some other kind of material that nature would tolerate and keep the bone and tissues in the apical region healthy, we would be doing a great deal.—*J. P. Buckley, D. D. S., Chicago, Ill.*

Why Teeth Should be Regulated:—Irregular teeth are a great mortification for a person who will always be greatly handicapped by a deformed mouth. It is also conducive to defective development of the face and leads to diminished nasal passages and consequent mouth breathing; on the other hand, a well-developed dental arch and palate with teeth in good occlusion are always accompanied by well-developed nasal passages and a normal-sized face; it is the greatest preventive of adenoids and enlarged tonsils.—*Geo. Roussel, D. D. S., Paris, France.*

Aluminum Base Plates:—Reasons why swaged aluminum base-plates are more susceptible to disintegration than cast base-plates. The purest and least contaminated aluminum to be had is not attacked by oral secretions. Chemical action can only attack through impurities embodied in the metal. Aluminum in ingot form, it is reasonable to suppose is uncontaminated, or the least contaminated. Aluminum rolled plate may, and undoubtedly does become contaminated. It is rolled in iron; it is swaged between base metal dies while saturated with oil, and impurities are practi-

cally driven into the metal's surface, there to be attacked and eaten out.—*R. C. Brophy, D. D. S., Chicago, Ill.*

The First Molar:—We must remember that the root of the first molar, erupting at about the sixth year, is not complete until the tenth to twelfth year, and allowing from three to five years after its appearance for each tooth to be complete and including the second molar, coming in at about the twelfth year, root formation will not be completed until the fifteenth to eighteenth year. During the earlier years of tooth development in the so-called permanent teeth, if caries be found, it is unquestionably best to use temporary fillings, but it must be remembered that just as soon as permanent fillings can be borne, the temporary fillings should be replaced.—*John F. Stephan, D. D. S., Cleveland, Ohio.*

A Point of Irritation:—On the lower jaw absorption occurs until the opening of the mental foramen, between the bicuspid and molar teeth is directly on top of the jaw, and as the plate is pressing upon this it binds upon the exposed nerve. The patient suffers much and I apprehend very few dentists are aware of it. When the dentist finds no cause for the trouble on the margins of the plate press the finger along the middle of the jaw and he will soon find it. Moisten a little whiting on the palm of the hand and with a spatula place a little bit on the white nerve as seen, and replace the plate, on removing which the identical location is seen on the plate. Relieve with small carborundum.—*L. P. Haskell.*

Swaging Rubber Plates:—Many times those who are sentenced to the use of artificial teeth, come to us asking if there isn't something than can be done to "keep their plate from falling."

Their dentist has either never known that it was necessary to turn the posterior margin of the plate up or has forgotten to do so, consequently there is no vacuum under the structure and of course no retention and the patient has become exasperated with it and discouraged.

Pour the palatal surface of the plate with plaster and let dry thoroughly; whittle away the plaster along the back edge, exposing about one-eighth inch of the rubber; heat the case up gradually

with dry heat until the rubber can be easily bent with an old tooth-brush handle or something similar; swage the edge well up and hold it there while it is plunged into cold water. Do not be afraid of overdoing it, if it proves to be too high at any point you can always disk off some of the newly formed edge if necessary. — *C. E. Allen, D. D. S., Chicago, Ill.*

MEMORANDA.

[Society notices will be given insertion in this department free of charge. Subsequent insertions will be charged for at the rate of \$2.00 an inch.]

WISCONSIN STATE DENTAL SOCIETY.

The following officers were elected at the last meeting:

President, Wm. Hopkinson, Milwaukee; Treasurer, A. Gropper, Milwaukee; Secretary, O. G. Krause, Milwaukee, 1209 Wells Bldg.

INDIANA STATE BOARD OF DENTAL EXAMINERS.

The next meeting of the Indiana State Board of Dental Examiners will be held at the State House, Indianapolis, commencing Monday, November 16th, and continuing five days. For application blank and full particulars address Dr. Fred J. Prow, Sec., Bloomington, Indiana.

MICHIGAN STATE BOARD OF DENTAL EXAMINERS.

The semi-annual meeting of the Michigan State Board of Dental Examiners will be held in the Dental College at Ann Arbor, commencing Monday, November 9th and continuing through the 14th. For full particulars and application blanks address, F. E. Sharp, Secretary, Port Huron, Mich.

MICHIGAN LICENTIATES PLEASE NOTE.

The licenses of all Michigan licentiates, whether practicing in the State or not, who have not paid their annual registration fee, will be revoked at the next regular meeting of the Board, which will be held in Ann Arbor, November 9th to 14th. F. E. Sharp, Secretary, Port Huron, Mich.

FEDERATION DENTAIRE INTERNATIONALE.

At the annual meeting of the International Dental Federation, London, England, August 6, 1914, the following officers were elected for 1914-15.

Hon. President, W. B. Patterson, London; President, Truman W. Brophy, Chicago; Vice-Presidents, Harvey J. Burkhart, Batavia, N. Y.; F. Schaeffer-Stuckert, Frankfort-on-main; M. Roy, Paris; W. Guy, Edinburgh; Rudolph Weiser, Vienna; Vincenzo Guerini, Naples; J. Howard Mummery, London; N. Etchepareborda, Buenos Aires; Ernst Jessen, Strassburg; Secretary-General, Florestan Aguilar, Madrid; Assistant Secretaries Burton Lee Thorpe, St. Louis; C. Van der Hoeven, The Hague; G. Villain, Paris; B. Landete, Madrid; Treasurer, Edmond Rosenthal, Brussels.

Next place of meeting San Francisco, August 30, 1915. Burton Lee Thorpe, Assistant Secretary.

WISCONSIN STATE BOARD OF DENTAL EXAMINERS.

The Wisconsin State Board of Dental Examiners will convene in Milwaukee at Marquette University, on December 14, 1914, at ten A. M., for examination of applicants to practice in Wisconsin. High School diploma, application and \$25.00 fee to be filed with the secretary ten days prior to above date. Dental diploma to be presented in advance of the examination. Junior Dental students presenting a clear card for two years unconditioned work from a reputable dental college and filing a high school diploma, or its full equivalent, will be permitted to participate in the theory examination in the following six major subjects: Anatomy, Physiology, Histology, Chemistry, Bacteriology, Materia Medica. The grades made in these subjects will be credited at subsequent examinations. Special application blanks for this examination and \$10.00 fee, together with high school credits to be filed ten days in advance. W. T. Hardy, Secretary, 1404 Majestic Building, Milwaukee, Wis.

NORTHERN ILLINOIS DENTAL SOCIETY.

The war in Europe may be of absorbing interest, but to the dentists of Northern Illinois it is as nothing compared to the coming meeting of the Northern Illinois Dental Society, which will meet at Elgin October 21-22, 1914. The commander-in-chief of this splendid company, Dr. G. B. Dillon, will present his President's Address on Wednesday, Oct. 21, at 10:30 A. M., after which such subjects will be considered as: "What About Alloys?," "Technique for Taking Impressions for Partial Dentures," "Report on Research Statistics," "Pyorrhea, Touching on the Vaccines," "Practical Adaptation of College Training," etc., etc. This will make a splendid program, and in addition to this there will be clinics of all kinds—which should really attract a large crowd. As a diversion the members may visit the Elgin Watch Factory, or the Asylum for the Insane, though it is hoped that they will not be obliged to remain at the latter place. Rest and refreshments may be had at the Fosgate, Kilby or Y. M. C. A., and the rates are scandalously low. At Unity Hall on Wednesday at 6:30 P. M. refreshments will be served the members, their wives and sweethearts. (You are probably reading this notice just before saying your prayers and going to bed. In the morning when you go to your office, reach for your appointment book and write opposite Oct. 21 and 22, "Northern Illinois Dental Society.") F. H. Bowers. Sec'y.

DENTAL COLLEGE COMMENCEMENTS.

LINCOLN DENTAL COLLEGE.

Graduates—G. D. Byrne, R. W. Casper, R. M. Hollingsworth, G. H. Hunt, J. C. Ough, A. L. Rousey, J. E. Ruzicka, J. L. Ubl.

UNIVERSITY OF CALIFORNIA DENTAL SCHOOL.

Graduates—A. Barr, D. G. Bell, H. A. Boalt, R. E. Brownell, J. A. Cunha, A. A. de Carvalho, F. N. Eaton, H. O. Eggert, C. A. Flanagan, J. E. Frates, C. R. Giles, F. D. Herd, E. L. Hicok, L. J. Jacobson, L. S. Jones, R. W. McCluskey, T. C. Muegge, H. P. Peck, H. C. Petray, W. R. Renwick, W. E. Rideout, W. E. Ross, H. L. Sams.

GEORGETOWN UNIVERSITY, DENTAL DEPARTMENT.

Graduates—W. S. Benedict, C. C. Bockey, C. A. Chandler, C. E. Channing, J. Cogan, G. E. Cox, T. J. Daly, L. M. Desmond, D. A. Doherty, J. J.

Eckert, W. A. Duffy, R. L. Eller, W. C. Farmer, G. C. Fowler, E. L. Gambill, R. Garcia, L. H. Geigel, F. J. Gargan, C. Gordon, H. H. Hefferan, G. A. Hewey, W. D. Hobbs, F. T. Marsden, F. V. Mechling, H. B. Meloy, W. A. Norton, P. H. Payton, W. M. Pierce, F. J. Schmitt, J. L. Spiegelblatt, J. A. Taylor, W. H. Ziervogel.

WESTERN RESERVE UNIVERSITY, DENTAL SCHOOL.

Graduates—A. R. Agate, R. M. Allen, J. I. Allen, J. Belford, L. I. Bergman, R. O. Bower, M. D. Castrigano, H. D. Conlon, I. E. Downey, P. W. Eggert, E. M. Feiman, J. V. Gentilly, G. Geroff, J. H. Goodman, E. W. Graebner, F. G. Greer, C. Hoffman, C. W. Hudson, E. L. Kihorany, C. P. Landgrebe, J. J. Leahy, C. A. Licht, C. J. Love, J. Majoros, C. J. Milling, J. W. Moats, P. H. Mullaly, F. A. Newhall, P. E. Nowak, C. P. Orth, J. P. Patterson, R. L. Prendergast, A. A. Read, E. W. Roth, G. W. Sandberg, G. A. Shilling, F. D. Singleton, C. T. Story, J. E. Uhler, H. B. Wall, T. H. P. Warren, W. H. Williams, J. H. Woods, W. W. York.

STATE UNIVERSITY OF IOWA, COLLEGE OF DENTISTRY.

Graduates—P. M. Anderson, R. J. Andrews, D. L. Bard, W. J. Barry, J. D. Bellamy, R. V. Brandt, C. W. Casady, L. V. Cockrum, F. M. Mitchell, D. L. Crissinger, P. J. Curry, L. R. Daley, G. J. Denzler, L. G. Dick, H. E. Duwe, J. M. Eason, J. C. Esser, W. F. Ettinger, N. Fukushima, T. C. Grotthaus, O. A. Haberdier, E. W. Howard, C. F. Huber, G. H. Humphrey, S. A. Katz, O. A. Langland, E. A. Laraia, C. C. Lawhead, R. C. Long, H. W. Louchs, M. A. McDewitt, R. L. Morse, J. C. Murphy, P. W. Qually, R. W. Rogers, C. A. Ross, J. Scholten, J. R. Simpson, R. C. Siple, E. S. Smith, R. M. Smith, V. R. Smith, E. R. Swank, R. D. Temple, J. C. Tymony, A. D. Ward, L. M. Wise, D. A. Wittrig, G. H. O. Wormhoundt.

MARQUETTE UNIVERSITY, SCHOOL OF DENTISTRY.

Graduates—W. E. Boyle, H. G. Bach, A. F. Baumgartner, L. B. Bernhardt, E. L. Bly, O. E. Brassington, H. Coyle, T. E. Davin, J. E. Dwyer, L. D. Elliott, W. E. English, E. T. Finucan, B. F. Fowler, G. M. Funne, A. C. Hagen, E. H. Heinrich, S. W. Herthel, A. E. Hess, A. G. Jennings, W. H. Kelly, E. A. Keppelar, H. Kistler, F. L. Kneip, R. R. Lally, F. Levenhagen, H. I. Lewis, F. J. Martin, E. W. Nickson, R. W. Niererer, R. J. Paradowski, L. W. Prescott, J. B. O'Hora, C. H. Ritsch, L. F. Rundell, C. Runge, J. W. Sweeney, R. L. Siebecker, W. C. Southcott, H. O. Schneiders, A. C. Sloan, F. Vater, W. Weinberger, G. Wilson, W. U. Walls, J. R. Woelffer, C. M. Walker, O. J. Wilda, A. J. Zimmer.

BALTIMORE COLLEGE OF DENTAL SURGERY.

Graduates—H. S. Allen, A. C. Bastedo, O. D. Bastey, M. H. Boylen, F. T. Bowness, J. R. Butler, L. A. Caballerro, C. E. Callery, A. L. Cairns, J. E. Colon, J. T. Coroso, J. H. Davis, H. F. DeRoche, H. W. Doremus, A. Francesch, J. J. Harrigan, G. R. Hennegar, A. A. Hogue, J. E. John, W. H. Kelly, P. O. Kluttig, P. G. Kochenour, G. L. Krueger, E. D. LeTourneau, R. E. Lowcock, E. L. Masten, J. Masterton, T. K. MacAleese, A. McAndrew, A. C. McCue, L. F. McKenna, J. M. McGrath, G. E. Mickens, J. T. Nock, F. P. O'Shea, A. A. Rehm, L. P. Rodriguez, M. E. Rogers, J. C. Ruman, H. W. Schall, C. W. L. Stanford, V. A. Suchorski, H. E. Taylor, T. L. Tincher, W. A. Turner, R. A. Turlington, A. A. Verville.

ROYAL COLLEGE OF DENTAL SURGEONS.

Graduates—I. H. Ante, N. S. Bailey, L. F. Boyle, H. K. Box, J. S. Bricker, E. H. Campbell, C. G. Chapin, M.D., H. A. Chartrand, H. J.

Clarke, G. Coveyduc, J. H. Duff, W. S. Elliott, F. W. Evans, H. G. Farrell, F. C. Fraser, G. Fraser, E. W. Fuller, B. R. Gardiner, J. S. Girvin, C. E. Higley, A. N. Mill, T. G. Hollingshead, H. E. A. Holmes, S. C. Ianson, J. I. Kelly, S. L. Kruger, L. D. Leonard, E. D. Madden, N. N. Mooney, G. C. McKinley, E. J. Norman, C. R. O'Brien, C. La V. Pattison, E. A. Roos, S. Rutledge, L. V. Savage, J. K. Scott, J. F. Sebben, A. V. Sinclair, A. J. Sipes, C. Soules, F. S. Spieres, W. D. Stevens, H. A. Stewart, D. J. Sutherland, D. P. Sutton, L. H. Thornton, R. G. Ward, P. J. Watson, A. C. White, G. F. Zimmerman.

COLLEGE OF DENTAL AND ORAL SURGERY OF NEW YORK.

Graduates—E. G. Antopolsky, L. Barnett, N. Bauman, F. Bedrick, C. K. Blaustein, I. Blumenthal, R. Blumenthal, E. McN. Bonnefond, A. J. Brucklacher, W. H. Drum, E. Eichel, B. Engel, M. Epstein, E. Feinberg, L. Finkelstein, B. A. Fischel, L. Freidland, F. W. Fry, S. Feit, C. S. Gabowitz, L. Gample, M. Goldwater, S. Greif, H. Hart, J. B. Hart, M. D. Harris, M. Hoorewitz, J. F. Howard, C. Jeshurun, T. Johnson, A. Katz, E. Kirchenbaum, M. Kompaniez, R. J. Lifschitz, C. E. Longnecker, E. G. Mark, F. N. McKeever, F. B. O'Brien, E. O'Neil, H. M. Potter, T. F. Prach, S. Pulvermacher, H. H. Reiss, L. Rosen, J. N. Sablow, D. Salzman, E. D. Schevcik, J. Schneider, J. Sheinman, J. Sommer, W. Veal, J. R. Vigiano, H. Weissman, B. T. Withers, F. Wolf.

HARVARD UNIVERSITY DENTAL SCHOOL.

Graduates—G. N. Abbott, A. Altshuler, W. I. Ashland, B. E. Bahn, D. S. Bedrick, T. N. Bello, M. Besas, K. E. Boldt-Christmas, A. B., E. V. Bowler, F. J. Caldwell, V. T. A. Curtin, B. C. Despotes, E. E. Dewyer, P. S. de B. Didsbury, R. H. Drury, R. B. Edson, N. Ellard, E. Finn, H. Fishman, H. I. Fiske, C. G. Fletcher, F. S. Frary, D. D. Freedman, J. H. Garvin, Jr., C. W. Goetz, I. Goldberg, S. R. Hayman, B. L. Higgins, J. Horgan, H. L. Kilburn, M. H. Lurie, J. S. MacGregor, B. S., W. H. Maguire, G. E. Mahoney, H. W. G. Marshall, H. F. McKanna, J. A. Morin, T. W. Murray, J. A. Nash, W. C. Niles, D. J. O'Mara, I. W. Pasmore, G. P. Pendleton, C. W. Proud, C. W. Rawlins, B. Rippen, A. G. Roitman, M. Schneider, R. G. Strickler, I. Urrows, S. H. Vaughan, W. E. Wade, R. L. Webster, T. A. M. Wilson, W. E. Young.

NORTH PACIFIC COLLEGE OF DENTISTRY AND PHARMACY.

Graduates—F. J. Beauchene, J. A. Campbell, A. E. Clarke, H. Clarke, V. A. Clemans, S. M. Cohen, F. A. Cozza, J. H. Cudlipp, W. R. Dinham, R. W. Donohoe, A. S. Doyle, H. R. Draney, W. E. Driskell, R. W. Earlywine, V. A. Earlywine, F. H. Entriken, J. J. Frits, H. C. Gill, H. Gillis, R. S. Goodwin, R. J. Greer, C. E. Hall, E. Hall, J. W. Herns, T. Hetu, M. C. Hill, G. M. Hoffman, W. A. Holden, W. C. Holland, O. J. Johnson, F. G. Keene, E. J. Kiesendahl, H. A. Labby, J. O. Lasher, A. M. Lowman, A. L. Martin, A. H. Meadowcroft, R. B. Miller, W. A. Norby, P. J. O'Donnell, W. H. Olson, R. E. Plummer, F. J. Richmond, G. R. Ross, L. C. Smith, C. L. Stanley, C. M. Taylor, L. E. A. Thomson, M. V. Tidball, L. P. Waitt, E. D. Warren, V. D. Wescott, L. S. Whetstone, E. G. Wisecarver, F. E. Wood, N. L. Zimmerman.

OHIO COLLEGE OF DENTAL SURGERY.

Graduates H. A. Bauer, R. H. Becker, G. A. Buchanan, S. R. Cain, J. S. Carper, W. S. Carper, F. R. Cropper, T. C. Daniels, C. F. Deller, J. C. Devine, J. L. Dunn, I. L. Faith, Miss M. M. Farrell, A. C. Foster, B. Fujiaka, J. S. Gault, G. N. Goshorn, H. T. Halstead, L. N. Hatcher, Mrs. E. Hedrick, H. M. Heintz, A. D. Hewetson, E. R. Hicks, N. S. Hilty, J. W. Holton, David Hughes, H. H. Hunter, M. Keller, O. E. Kress, L. G. McClellan, G. M. Markham, A. I. Marple, R. S. Neely, E. R.

Plunkett, E. R. Polhamus, W. F. Reynolds, F. S. Robbins, J. A. Shay, D. E. Short, F. M. Shupert, S. Spirkoff, R. C. Stephens, H. J. Stevens, R. A. Stout, E. O. Swander, W. L. Thompson, H. S. Threlkeld, R. C. Trowbridge, R. Trujillo, T. J. Turley, J. E. Wagner, A. J. Williams, T. E. Wright, E. C. Zeigler.

TUFTS COLLEGE DENTAL DEPARTMENT.

Graduates—E. E. Bachelder, R. P. Beckman, P. L. Bonnell, A. J. Brass, H. W. Brown, S. J. Burke, M. C. Canarie, J. L. Carroll, J. H. Clifton, H. E. Danforth, J. M. Desmond, J. P. Eagan, A. G. Ekdahl, L. W. Everson, E. M. Fisher, E. A. Fitzpatrick, M. Ginns, R. H. Griffin, H. W. Gussman, H. O. Harding, J. E. Herlihy, G. L. Johnson, R. K. Johnson, J. M. Kelley, V. J. Kingsley, M. Lan, J. W. Laurie, L. H. Lavien, M. W. Lewis, S. Maker, J. A. Manning, H. W. Mayo, P. S. McGann, F. W. T. McKinnon, R. H. Miller, M. Mitchell, W. L. Murphy, W. A. O'Brien, W. T. O'Neil, Jr., H. Pearlin, J. G. Perman, E. W. Peterson, H. C. Pierce, G. L. Plummer, H. E. Ray, J. A. Regnier, R. R. Rich, H. Roberts, J. H. Rooney, M. W. Rowlandson, M. A. Sanderson, E. Scher, H. R. Sibley, H. H. Stahl, L. M. Staples, J. E. Sullivan, J. W. Sullivan, J. A. Tartre, T. H. Veale, E. M. Webb, F. I. Weene, F. E. Williams, J. C. Wilson, H. I. Yale.

UNIVERSITY OF MINNESOTA DENTAL DEPARTMENT.

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NITROUS OXID AND OXYGEN ANESTHESIA AND ANALGESIA.*

BY LOUIS SCHULTZ, D.D.S., M.D., CHICAGO.

The history of nitrous oxid as a general anesthetic has been a rather peculiar one as compared with chloroform and ether. The former, introduced by Wells in 1844, came into disuse when Wells died in 1848, and remained in a dormant state until 1862 or 1863, when Colton urged its use in dental surgery. Ether introduced by Morton in 1846, and chloroform by Simpson in 1847, enjoy a different history, inasmuch as they quickly became favorites in the surgical world, and have remained so up to the present time, especially ether. Nitrous oxid has enjoyed constant use since 1863, but this use was limited principally to the dental office.

In 1868 Edmond Andrews of Chicago introduced the use of oxygen in conjunction with nitrous oxid for prolonged anesthesia, but this method did not come into vogue until very recently. Up to a few years ago nitrous oxid was used for very short anesthesia only, and as it was given, the patient was usually asphyxiated, and the work done while he was recovering from the asphyxia. The last few years, however, have wrought remarkable changes. We now anesthetize patients and keep them anesthetized any length of time without producing cyanosis at any stage, when formerly it was taught that cyanosis was one of the concomitant symptoms of nitrous oxid anesthesia. Today nitrous oxid is used quite freely in the surgical world, and still it has not yet found its full range of application in surgical procedure. Since the introduction of nitrous oxid analgesia the entire question of anesthesia and analgesia is gaining in importance as the benefits derived therefrom become more manifest and better known. Every question of impor-

* Read before the Chicago Dental Society, September 15, 1914.

tance finds its adherents as well as its opponents, both striving for the truth, although approaching the subject from a different standpoint, and this statement is quite true of the matter in hand, especially since the advent of analgesia. Its adherents hold: First, that the method is devoid of danger. Second, that a series of a few lectures will fit one, who has never used the agent, to successfully administer it. Third, that all appreciably painful dental operations should be rendered painless by the analgesic or anesthetic route, and so all physical and psychical shock be eliminated. On the other hand, its opponents claim: First, that the indiscriminate use of the method is dangerous. Second, that it is a fad which will die an early and natural death. Third, that pain, within limits of course, is beneficial, rather than otherwise, since nature has equipped us to feel pain, and excessive pain may be better controlled by other means at our command.

This conflict of opinion brings up the following questions for discussion: First, when is the use of the method devoid of danger, and when is it dangerous? Second, can a novice become competent by means of a few lectures? Third, is this method a fad which will die an early and natural death? Fourth, is pain caused by the treatment of a pathological condition ever beneficial? Fifth, should all appreciable pain be controlled by nitrous oxid plus oxygen?

Nitrous oxid enjoys an enviable record, so far as safety is concerned, and in the hands of the competent operator it is the safest general anesthetic known. Its mortality is lower by far than that of any other general anesthetic, and when we consider the class of cases in which it is used, its record becomes quite remarkable, for it is *used* by competent surgeons as the anesthetic of choice, when neither chloroform nor ether could be given. It is indicated in patients who are debilitated, anemic of low vitality, or who are very ill; in short operations, minor operations and the setting of fractures. Bevan says: "It is indicated in bad surgical risks, such as intestinal obstruction, typhoid perforations, general peritonitis, in patients with bad kidneys, etc." (Bevan, *Journal A. M. A.*, December 2, 1911; p. 1821.)

I have had occasion to give this anesthetic in a number of bad cases, in which the exhibition of chloroform or ether was absolutely contra-indicated, and in which an anesthetic was necessary, lasting from thirty-five minutes to an hour to enable the attending surgeon to perform the necessary operation, such as the removal

of a "pus kidney" or the repair of a fractured patella, etc., and so far have not had a bad result.

A number of fatal cases, however, have been reported in literature, and I shall cite the following to corroborate what I said with reference to the class of cases in which it is given. Olow reports a case of death in a man 53 years of age, very stout, emphysema and sclerosis of the coronaries; three minutes after taking the gas, and not being deeply anesthetized, he developed a sudden cyanosis and stopped breathing, artificial respiration and the exhibition of ether hypodermically was of no avail, cardiac failure occurring half a minute later. (*Journal A. M. A.*, Vol. 58, No. 8, p. 596.) This is an example of a bad risk in which death occurred very early after the induction of the abnormal state, though as a rule untoward symptoms appear after prolonged anesthesia, coming on suddenly, beginning with cyanosis, followed by cessation of respiration, with cardiac failure closing the scene. Freeman Allen reports three fatal cases, one of which he cites as his own, and says that his patient was a profoundly uremic and almost pulseless man. (*Journal A. M. A.*, Vol. 58, No. 6, p. 395.) The fact that nitrous oxid is used mainly in cases in which neither of the other two general anesthetics could be used, and that in that undesirable class of patients very few deaths have occurred, proves beyond a doubt that nitrous oxid is the safest general anesthetic known. But that does not mean that it cannot produce a fatal issue. Bennett of New York warns of sudden alarming symptoms arising in cases of prolonged anesthesia, and Teter agrees with him and shows that few of his cases, comparatively speaking, were of the prolonged type. I think this shows sufficiently how imperative it is that a skilled anesthetist administer this agent, at least whenever prolonged anesthesia is required, one who in the critical moment remains cool and perhaps is able to prevent a fatality by reason of his knowledge and skill in that work.

I shall have nothing to say about rebreathing, as the time does not permit me to enter into that phase of the subject, and it is not used in analgesia, and seldom in a short anesthesia, except that if used at all, the bag into which the patient breathes should be close to the face of the patient, and all parts easily sterilizable. Personally, however, I should prefer, as Prince suggests, to use an extra cylinder of carbon dioxid from which to administer that gas when

needed, rather than use the unhygienic method first referred to. (Prince, E. M., *Journal A. M. A.*, Vol. 58, No. 18, p. 1344.) So much for prolonged anesthesia; fortunately in our work as dentists we are not called upon to maintain patients in that state, but in almost all cases we can accomplish our purpose in a very short time and those short anesthetics are the kind which experience shows are quite safe.

Specialists in extracting teeth (exodontists?) use it as a routine method, because of its safety, also because of its quick action, the patient recovering quickly, and its odor not being objectionable. For the same reason it is used by a good many operators as an anesthetic and analgesic in general office practice, and where it is so used for short periods of time, and by competent operators, it is perfectly safe. But there are other points which make its use as an anesthetic desirable and safe. For instance, it does not lower the resistance to disease as do chloroform and ether, a very important point in certain cases, and this is due to the fact that nitrous oxid does not change the constituents of the cells as do the other two agents mentioned. For example, the latter dissolve lipoids, while nitrous oxid does not. This is most important, when we reflect that lipoids occur in all cells of the body, and that chloroform and ether thus dissolve part of the cells of our organs, the brain cells, liver cells, kidney cells, red blood cells, and, most important of all, the phagocytes, while nitrous oxid does not. Hence, the former lower the resistance to disease by virtue of their action on the phagocytes principally, and produce a deeper anesthesia because of their effect on the brain cells, while nitrous oxid does not lower the resistance to disease, because it does not change the constituents of the body cells, and induces a lighter anesthesia by virtue of its oxygen interference producing anoxemia of the brain cells. Another point: Hamburger and Ewing show that nitrous oxid does not reduce hemoglobin, nor does it cause increased hemolysis; hence, its exhibition is not followed by anemia. They admit, however, that there is a constant curve showing a marked rise in hemoglobin and red blood cells during the anesthesia, followed by a drop to near normal immediately after the gas is withdrawn, but this is a transient change and of no clinical significance. (*Journal A. M. A.*, Vol. 51, No. 19, p. 1590.)

There yet remains another point to be discussed with reference

to the safety of this anesthetic, and that is its effect upon the blood pressure of the individual. Frequently, one hears the statement, and for that matter, one meets with it in literature, that nitrous oxid raises the blood pressure, and there is no doubt that the blood pressure is markedly increased where nitrous oxid is given in a manner to produce cyanosis. And in those cases, it is due to the combination of carbon dioxid and nitrous oxid and the great lack of oxygen, rather than to the nitrous oxid itself. In the average patient a rise of blood pressure of 10 m.m. of mercury for the short period of time that he is under the influence of the agent is of no consequence, but in patients suffering from decided vascular changes, usually attendant upon senility, such as arterio-sclerosis, etc., in whom a rise of blood pressure might be dangerous, this factor should always be considered. In analgesic work the proper admixture of oxygen is sufficient to keep away all signs of cyanosis, and the blood pressure in those cases does not rise more than 10 m.m. of mercury. Both Teter and E. M. Prince agree with this latter statement when they say that the blood pressure is not raised to any great extent when enough oxygen is given. I have taken the blood pressure in a number of cases, in order to get at the facts in the matter, and have made an unexpected discovery. I have found that in some cases the pressure rose 20-30 m.m. of mercury before the administration and this was not due to undue excitement. During analgesia, and during pink anesthesia it rose another 10 m.m. to fall to normal after the agent was withdrawn. I have not taken these measurements in patients with a known high pressure, but will do so as occasion presents in order to determine whether nitrous oxid will raise such a pressure 10 m.m. as it does in normal cases. There is no doubt but that the elimination of cyanosis adds to the safety of the patient, and that a so-called pink anesthesia or analgesia should always be given. In prolonged anesthesia, the addition of about 5 per cent of ether has been recommended to prevent an undue rise in blood pressure. Judging from my own observations, it would appear that we have to contend with a rise in blood pressure, not of 10 m.m., but of 30 to 40 m.m., at least in some patients, and yet experience seems to show that even such a rise, being temporary, is not dangerous. This applies to normal cases, of course, for, as I stated before, my observations do not include so far cases of permanent high blood pressure due to arterio-

sclerosis, etc. A study of the behavior of the blood pressure of our patients when they come to have some painful work done would, I believe, be of great interest to us all. I am not at all sure but that the blood pressure rises a great deal more from fear and anticipation of pain than from nitrous oxid, and if so would not the administration of the gases be the lesser of two evils when the patient has lost such fear after the second or even the third sitting? I hope to be able to gather sufficient data on the subject with the view of offering an authoritative report at some future date.

I have made reference to the advisability of having an experienced operator administer this agent, and I wish to give further reasons for that statement. In the first place, alarming symptoms, when coming on, are not detected early enough by the inexperienced, no matter how much theoretical knowledge he may possess. Furthermore, a theorist cannot possess that confidence, which comes with experience, and not having that confidence, he cannot inspire his patient with it. I can understand how an inexperienced operator could make the following statements: "I gave her the gas twice, and at the third sitting, I had her that far that she said she could stand the drilling without it," and "under analgesia the patient has no time to think about pain, he is afraid of it, because he worries all the time whether he is going to escape alive or not." (Kabell, DENTAL REVIEW, Sept. 1913, p. 934.) But all of us, who have experience, know that the latter statement is diametrically opposed to the truth, and does not rest upon a foundation in fact, because the first thing that happens to a patient inhaling this agent is to lose the very fear alluded to above, and he gets into a frame of mind which may be described as not caring whether school keeps or not, and this furnishes one of the most potent reasons in favor of its use. The first statement simply reflects the mental attitude of the operator toward this agent, and brings to my mind the question of experience with it, and confidence born by such experience, or rather, the lack of it. But there are other reasons, aside from those mentioned, that make it desirable that the operator should be experienced. When we consider that, with this agent, we carry a patient from the normal state to surgical coma in from one to one-and-a-half minutes, we can appreciate that when untoward symptoms arise, prompt action is very essential, and the operator must be cool and decided in his efforts to avert an unpleasant

experience. An operator lacking experience should be very careful to watch the patient's color and respiration. At the first sign of cyanosis, he should increase the percentage of oxygen, or resort to pure oxygen for one or two inhalations, and then return to the first combination. No apparatus, however, has been devised so far, nor can one ever be devised which is automatic, or fool proof, or which can be set to suit all cases, for each patient is a law unto himself and requires his own adjustment of the two gases, and even that adjustment may have to be changed during the administration. There is need at the present time for the establishment of a comprehensive course, not only theoretical but principally practical, embracing the use of nitrous oxid and oxygen as an anesthetic, and especially as an analgesic, and if I were to make any suggestion I would submit that in the curriculum of every dental college such a course should be incorporated to the end that every graduate be proficient in the use of this agent.

De Ford quotes Friesell, Dean of the Dental Department of the University of Pittsburg, as saying that dental schools must devise and teach safe and certain methods of anesthesia and analgesia, in order to eliminate pain absolutely from dental operations, and this view I heartily endorse.

Nitrous oxid anesthesia is an accepted necessity in the practice of dentistry, but its younger sister, analgesia, does not as yet enjoy such an undisputed field. However, I am one of those who believe that it has come to stay, and that, as its merits become more manifest, its use will become more universal. Everything of value used in the practice of dentistry has had its day of trial, the various filling materials and lately inlays have all found their place. While at first perhaps recommended as best in every case, and later condemned as not much good in any case, they have finally established themselves on their merits as their indications and contra-indications became manifest. Nor is this experience confined to dentistry alone, for our sister profession, medicine, has shared it and is sharing it. For example: Tuberculin, at first proclaimed a practically infallible cure for tuberculosis, and widely used, came into disrepute because of the many deaths resulting from its administration, but when Wright brought us the doctrine of opsonins and gave us the opsonic index, the proper dose and rational method of using Tuberculin resulted, and today Tuberculin is used and used prop-

erly in cases where indicated. And so we find the pendulum swinging first to one extreme, then to the other, until a remedy is sufficiently tried out, and its indications and contra-indications firmly established. Salvarsan, or 606, furnishes another example, and, more recently, Neo-Salvarsan; radium and radio-active substances being among the latest agents coming into the limelight.

The most potent factor in favor of the use of nitrous oxid and oxygen as an analgesic is that it removes the anticipation, the fear on the part of the patient, and this occurs after the second or third inhalation usually. This fact alone is important enough to warrant the use of the method, but it does more than that; it puts the patient's mind in a condition favorable to receive suggestions, so that the operator has this added advantage, aside from the fact that it actually does take away pain. There are some cases where a show of sympathy, combined with gentle manipulation, and the use of sharp instruments are all that is necessary. In others, we may be able to divert the mind of the patient from what we are doing by a discussion of some subject of great interest to the patient; in other cases still, local anesthesia may be the best method, but there remains a large number of cases, where I feel that I would not do my whole duty to my patient unless I removed his greatest objection of coming to a dental office, and that is the fear and the anticipation of the things that wait for him there. But I repeat, it does more than that; it actually removes the pain itself, it keeps our patients free from shock, it is not unpleasant to take, especially if, as De Ford suggests, the odor be disguised by a few drops of essence of orange placed in the inhaler, and, finally, it leaves no unpleasant after effects.

The very fact that it actually takes away the pain has been used as a point against it, as though the infliction of pain in the treatment of disease was a desirable thing. I know of but very few exceptions to the statement that pain caused by the treatment of a pathological condition is never beneficial. So well is this statement recognized by the medical profession the world over, that it is no longer a question, but an accepted fact. A surgeon operating without anesthesia would have nothing to operate; an accoucheur withholding the anesthetic in cases of confinement would have nothing to confine; more than that, such an attempt would be likely to result in severe censure or worse. Very few operations are undertaken

in surgery without some kind of an anesthetic, and those must be of very short duration, and in a field hard to anesthetize. There is no question about the use of an anesthetic in the extraction of teeth, and yet the pain inflicted in the preparation of some cavities is greater, and of longer duration, and I cannot help feeling, therefore, that the control of that pain, or better, its removal, is of even greater importance than the control of pain in the average extraction, especially since the analgesic state is all that is necessary to do it.

I am well aware of the fact that pain is one of nature's ways of protection. It is her method of help, as in burning, scalding, etc., so that we can save ourselves from serious injury or death; even a pulpitis is nature's way of inducing us to seek help and protection against caries, but here it serves a useful purpose, and cannot be likened to pain inflicted during treatment. Another view, to which I must take exception, is that the pain sense is necessary, and, in fact, is guiding us when approaching a live pulp in deep cavities, and helps us to keep from exposing it. I find that in every case treatment must be adapted to the conditions present, and if caries encroach upon the pulp to an extent that we fear its being infected, the pulp had better be destroyed in the average case, rather than to temporize with it, and later treat an abscess. If the tooth be not involved to such an extent, our knowledge of its anatomy should guide us while preparing the cavity. I am free to confess that I have opened into a few pulps quite unintentionally, before I used this method, and I am equally free to say, that since using this method, the accident has occurred no more frequently in my hands; but I find this difference, that I can excavate deep cavities better and easier and line them with some suitable non-conductor of thermal changes, and so save the pulp in those teeth, when I induce analgesia, than I could before I used this method. My experience, at least, contradicts the statement that to remove the sensibility in a deep cavity endangers the pulp.

Should this method then be used indiscriminately to control every form of pain in the dental office? I don't believe that an operator could be found who would so hold, no more than we would advocate pulp extraction in every carious tooth, or the restoration of lost tooth substance by means of inlays in every case. I maintain, however, that there are a large number of cases where it is

indicated. Whenever fear or pain would result in enough shock to warrant its use it should be employed, and that condition obtains in far more cases than where a good operation could not be done, or no operation could be made short of leaving a shattered nervous system from the excess of suffering. I hold it to be my duty to prevent shock whenever I can, and I, for one, can accomplish that with nitrous oxid and oxygen quicker and easier than in any other way; and I firmly believe it to be the duty of every operator to eliminate pain, no matter what method he employs. I think that probably I can accomplish more with this method by virtue of my long association with it, and I know that with its aid the patient loses what fear he may have, and so I prevent psychical shock and as soon as the state of analgesia is established the afferent nerve impulses are blocked sufficiently to prevent physical shock, due to the painful impressions incident to cavity preparation, etc.

In conclusion, let me briefly outline the method I use for inducing both analgesia and anesthesia: First, so far as the apparatus is concerned, I use large cylinders with regulating valves, in order to get an even flow of gases to the apparatus. The objection to the small cylinders is that the valves freeze easily owing to their small caliber. The gases flow through pipes a distance of about twenty feet to the gas apparatus, where they are controlled by means of a valve before they reach their respective bags, and for the use to which I put them they become sufficiently warm in traveling along that distance to make a warming device unnecessary. I use both nitrous oxid and oxygen, as that is the only scientific method, which enables us to produce an even analgesia and anesthesia, since you can regulate the amount of oxygen to prevent all cyanosis and can keep your patient at the same level throughout the operation. Where oxygen is not used and the admixture of air is depended on to keep off cyanosis, the anesthesia will not always be as even, because there is not a sufficient amount of oxygen in the air for most people to keep them anesthetized without cyanosis. At any rate, it is much easier to give a pink anesthesia with the combination of gases than with nitrous oxid alone. Opening the main valve of the cylinders, as far as the valves will permit, I set the reducing valve at from ten to twenty pounds pressure to have enough gas available all the time, although I very rarely have to use pressure, keeping the bags about half to three-quarters full of gas, I provide for the

proper mixture at the apparatus and let the patient draw the gases out of the bag, through the nasal inhaler, which the assistant holds to the patient's face, air valves wide open. A few words are in order with reference to the preparation of the patient. If the case is for analgesia only, my assistant sees to it that the clothing is loose, and that is all the preparation that is necessary for such a case; but if both analgesia and anesthesia are to be induced at that sitting, or if the case requires an anesthetic from the beginning, she not only sees to it that the patient has unimpeded respiration, but also that the bladder is empty and that plates or removable bridges are removed. If a patient coming for the first time be inclined to be at all nervous, she is reassured by the assistant while being made ready, and I explain to them before beginning: First of all, that they are not to lose consciousness, because I want them to answer my questions throughout the sitting; that they can take as much or as little of the gases as they choose, because I arrange the apparatus so that the gases are merely available to them, but do not flow unless they inhale them from the bag. I then instruct them to breathe through the nose until they feel a tingling sensation in the extremities, then breathe through the mouth, and if they notice that the tingling sensation leaves them at any time during the sitting, or if they begin to feel pain, they should breathe through the nose again, and I assure them that if they follow my instructions, they will feel absolutely no pain throughout the sitting. During the administration, my assistant watches the patient closely, and at the first sign of cyanosis, or if the patient become sluggish in answering questions, she admits a little more oxygen, or tells the patient to breathe through the mouth, whichever is most expedient. I do not often bother my patient with the saliva siphon, but ask them to expectorate into the cuspidor whenever it is convenient for them, and they do that the same as a person would in the normal state and as soon as they get their heads back in the head-rest, I continue my work, the assistant holding the nosepiece to their nose again. I have already touched upon the fact that an automatic machine is an impossibility, for the reason that the proportion of nitrous oxid and oxygen varies with each patient, and proper adjustment depends upon the effect of the nitrous oxid and the color of the face. This same reason makes it unnecessary to measure the percentage of oxygen. It is needless to say that in the preparation of

sensitive cavities, all painless work should be done first, such as the breaking down of overhanging enamel walls, etc., before analgesia is induced. Sensitive gingival cavities should, of course, not be approached until after the patient is in the analgesic state. The sittings should be made short, and no attempt should be made to prepare an extra large number of cavities at one sitting, nor to work more rapidly than one would on a patient who stands pain well. I have shown above that what little danger there is in this method arises where the patient has been kept in the abnormal state for a considerable period of time, and while I am well aware of the fact that it is the safest general anesthetic we have, yet must we not be misled by the statistics based upon short administrations in almost all cases, but must be mindful of the fact that cases of death are on record, and alarming symptoms have been reported, and usually in prolonged anesthesia. So I believe that it is a very important matter, and one which I would emphasize as strongly as I know how, that the sitting should be short. If, now, I choose to prepare one or more cavities, and remove one or more live pulps, and perhaps extract one or more teeth at one sitting, I would not spend too much time on cavity preparation; and by that I mean, I would not prepare three or four or five complicated cavities, nor would I contemplate the removal of pulps, in which the element of time would be a factor; obviously, no one would attempt the removal of pulps from attenuated and crooked canals in molars, which might take an hour, as has been suggested, but one can with safety prepare a cavity or two, extract a number of pulps in the anterior teeth, if necessary, and even extract a few ordinary and unimpacted roots or teeth at the same sitting.

I have previously mentioned, that the statistics relative to the mortality of nitrous oxid anesthesia are very largely made up of short administrations in which the face inhaler was used, the patient rapidly pushed to a state of anesthesia, or perhaps better, asphyxia, and the operation performed while the patient recovered from this state. Since the advent of oxygen as an aid in nitrous oxid anesthesia, and the nasal inhaler, prolonged anesthesia has been introduced, but still by far the greatest number of cases reported consist of short administrations, comparatively speaking. Teter, for instance, reports over 3,000 cases in which the anesthesia did not exceed from five to fifteen minutes, while those extending over :

longer period of time are very much less in number, and this holds true of most all operators using this agent. It seems, therefore, only the part of prudence and wisdom to make the sittings as short as possible, even though the analgesic state only is induced, and to be extremely cautious when sittings have to be prolonged, at least until time enough has passed to give us more experience with the agent when used as an analgesic. It is a very easy matter to have the patient pass from the analgesic to the anesthetic state, and this is a very satisfactory point in the case of nervous and timid patients, who have some extraction or the removal of live pulps in anterior teeth before them. They will often say, "If you could only get those teeth or roots out, so that I don't know anything about it, I should be delighted." When these people are in the analgesic state, and I have finished my cavity preparation, I simply shut the air valve on the inhaler, and tell them to breathe through the nose, and two or three inhalations make them unconscious, and a few more make them ready for either pulp extirpation, or tooth extraction, or both. On recovering from the anesthetic they usually know nothing of what happened, except that they think they took a little too much, and when told that that much dreaded extraction is past, they are more than delighted.

I cannot leave this part of the subject without a word of caution with reference to rapid work. One often hears the statement, and in talking the matter over with the patients they often express the opinion, that when they are in that state the operator can work much faster than he could were they to feel the pain. This should never be done. Just as much care should be taken by the operator with reference to the use of sharp instruments as if the patient felt the pain; nor should he use the burr any longer, nor push the work any harder, than if he was working on a patient in the normal state who is not over-sensitive. The shock to the pulp, while not felt, is just as great, and the danger exists that too rapid work will be followed by pulpitis, and even death of the pulp and later abscess. I was impressed, even before using this method, with the facility with which a pulp could be damaged, and still I remember that in my early days I had a case of pulpitis develop after a cavity preparation under analgesia, in spite of what I then considered ample precautions against overheating. And so I use this method, not so much with a view of saving time, except, perhaps, in the nervous

and hypersensitive, but rather for the purpose of eliminating fear and anticipation and avoiding pain and shock. One administration usually suffices to make the patient feel at home with it, and after that they demand it. Men usually express themselves as being ready for the next jag. Women enjoy the perfect rest of mind and body which comes with it, and both glory in the absolute loss of fear and anticipation of pain, as well as the pain itself, which marked their previous sittings in the dental chair.

Such is the action and the effect of the agents under discussion, and I hope that this paper will contribute its mite to the greater and more rapid spread and application of analgesia in dentistry.

LOCAL ANESTHESIA AND ITS USE IN DENTAL AND ORAL SURGERY, INCLUDING CAVITY PREPARATIONS.

BY HERBERT A. POTTS, D.D.S., M.D., CHICAGO, ILL.

The earliest recorded efforts at anesthesia are by the ancient Egyptians and Chinese, Greeks and Romans, also by the African medicine men who administered sleeping and depressing potions. Alcohol has long been used in this manner and is even to this day.

In the latter middle ages this treatment was abandoned as it was noted that the patients who had been so poisoned did not withstand the operation so well nor recover as quickly as those who had had no narcotics. The fact that many patients suffering from painful afflictions often pressed hard upon the painful part, lead Corrodis to tightly bind the extremities thereby rendering operative procedure less painful. This was practiced by the Arabians, also by Ambrose Paré in the 16th century. A little later the application of cold was used by the Severins. This, however, was forgotten until February 1807 when Larrey, chief surgeon to Napoleon's army, was forced to do amputations in an atmosphere 19° below zero, and found them painless. The application of drugs to skin and mucous membranes for the alleviation of pain consequent to surgical operations is as old as surgery itself, but in 1866 highly volatile drugs were used with considerable success until 1884 when Koller¹ introduced

* Read before the Chicago Dental Society, September 15, 1914.

the use of cocaine, which marks the real advent of local anesthesia. The number of deaths occurring from its use led to investigations and study by various men, chief among them were Schleich,² Reclus,³ Corning,⁴ and Matas,¹⁰ who introduced the infiltration method by which means much weaker solutions were used; intoxications and deaths were still encountered and were further reduced in number by the addition of the extract of suprarenal capsule as recommended by Braun which not only enhanced the anesthesia but made possible the use of still weaker solutions, and retarded the absorption of the drug to a great degree.

Further the synthetic preparation of cocaine substitutes has reduced the toxicity to a minimum degree and the consensus of opinion is that novocain combined with suprarenal extract, or the synthetic preparation, in an isotonic salt solution is an ideal local anesthetic. The rapid improvement in technique has been remarkable in that the use of a local anesthetic, at first confined to operations upon skin and mucous membranes, now makes possible the performance of most operations which before required a general anesthetic, lack of knowledge regarding it, alone, being responsible for its lack of use by the general surgeon. Given a drug which, when brought in contact with the end organs of sensation or the nerve trunks, which will with safety interrupt painful sensations and leave no deleterious after-effects, it remained for Schleich, Reclus, Bier,⁵ Braun,⁶ Prinz,⁷ Fischer⁸ and many others to develop the technique of applying it and we are indebted to these men for having well-nigh perfected local anesthesia.

Local anesthesia is now used extensively as an adjunct to general anesthesia. It has long been known that injury or traumatism to large nerve trunks is conducive to shock and in order to minimize the shock consequent to amputations the large nerve trunks are retracted and anesthetized at a point just central to the point of division. The classic investigations of Crile⁹ have explained the control of shock by this procedure of anoci-association. In his experiments Crile showed that animals under a general anesthetic are in a state of low vitality and that the cells of their brains show a lack of vitality and corresponding physical changes. He found that when the brain,

which is the real seat of pain is disconnected so to speak from the part operated upon, no shock followed the operation, furthermore if the wound be kept anesthetized from one to three days by the use of urea hydrochlorid and quinine also injected at the time of operation the tissues being infiltrated with it, nerve-exhausting stimulations were avoided, the wounds healed more rapidly, the post-operative complications and disagreeable sequela were very much minimized.

These studies should teach us the ill-effects of pain upon the human organism and it is our duty to avoid its production by every possible means.

We have all seen patients whose dread of pain in the dental chair has amounted almost to a mania and has deprived them of much needed dental services until the pain of pulp exposure or abscess has driven them to it, alas too late, and hyperemia, pulpitis, alveolar abscess, necrosis and chronic focal infection with all consequent evils must, in many cases follow the very best dental service which can possibly be rendered at that time.

Such conditions would have been avoided in the vast majority of cases had the patient been disillusioned and such illusions can only be dispelled by education of the dentist in the art of local anesthesia for if he is not able to operate painlessly the public can never be led to believe he can.

While in Vienna I was in need of dental services and visited Dr. Schreier of Kalium-Natrium fame, who, by means of hypodermic injection of cocaine prepared a very sensitive cavity much to my relief, as the operation was entirely painless. A year later while in Bier's clinic in Bonn, Germany, I was very much chagrined by one of my colleagues who said to me "Why is it that you American dentists who boast of your ability are not able to operate painlessly? Is it because your lack of medical training and knowledge of drugs makes you afraid or have you not mastered the technique of local anesthesia?" I was compelled to answer that it was a combination of both. We were at that time doing painless operations upon all parts of the body, viz., all operations below the umbilicus by means of spinal anesthesia, upon the extremities by venous anesthesia, in other parts by conductive anesthesia, and surgery of the mouth and contiguous parts by a combination of conductive and infiltration

or mucous anesthesia. I am convinced that much of the disrepute to which local anesthesia has fallen both in the minds of the laity, and dentists as well, has been due to a failure to observe the first rule of surgery, viz., asepsis, and the extensive sloughing and infection which has followed local injection has been due to non-sterile solutions, septic syringes and needles, septic forceps, or by crowding septic material already present upon the teeth (calculus) into the wound ahead of the forceps, but the real reason for its non-use is a failure of dentists and surgeons to master the technique of its induction. We know that the application of novocain to the sensory nerve-endings or trunks will paralyze sensation and the development of a technique to "get it there" must necessarily broaden the field of its usefulness. The addition of suprarenal extract or the synethetic product not only enables us to operate upon a bloodless field but by the anemia which it produces it enhances and prolongs the anesthesia, and enables us to use less of the drug. Its greatest value, however, lies in further reducing the toxicity of the novocain; Klapp¹¹ has shown by experiment that the absorption of novocain is greatly retarded by suprarenal extract. It is known that the longer the anesthetic remains in the tissues the more stable is the combination between it and the cells, consequently it is more slowly thrown into the circulation and as it is the action of a concentrated solution within the blood upon the vital centers which produces systemic poisoning and death, its rapid absorption must be avoided, this may also be accomplished by binding the part and by refrigeration. Whenever possible local anesthesia should supplant general anesthesia, because it is much safer, it is easier to operate with the patient conscious, (this particularly applies to the field of oral surgery where the normal tone of the tissues is preserved, saliva and blood can be expectorated, the laryngeal reflex is not abolished, thereby avoiding aspiration of foreign bodies) and many other reasons not the least in importance, is the fact that general anesthetics lower the opsonic index and favor coagulation of blood inviting thrombophlebitis and septic pulmonary embolism, as has been shown by Hamburger and Davis.

Dangers of local anesthesia: These are chiefly due to toxic doses of the drug given especially in concentrated solution which

are rapidly thrown into the blood stream, idiosyncrasy plays a part, but a comparatively small one.

One must here consider the dangers consequent to errors in technique for if an infection occur it is not the fault of the anesthetic but the fault of the anesthetist.

One must consider the age of the individual, remembering that children and old people are more susceptible. Before using any toxic drug one should become familiar with its physiological action and toxicology including the physiological and chemical antidote.

As novocain is almost identical with cocain we will consider the symptom complex of systemic poisoning from cocain. Housmann who has made an exhaustive study of the drug says that the lightest form is manifested by a sudden dizziness, usually very shortly after its injection, which rapidly subsides. This attack may continue and pass into a state of collapse with small rapid pulse, with subjective symptoms in the cold extremities, irregular and labored breathing and cold sweat. And in more severe cases loss of consciousness which in a few hours advances to a very weakened condition, vomiting is not infrequently observed. It is probable that the condition of cerebral anemia induced by the drug and psychic shock is responsible for some of these transient symptoms. In a higher grade of toxemia the symptoms represent a cerebral cortex irritation, the patients are unduly excited, laugh, seem unnaturally happy, talk rapidly upon various topics, may be delirious or have hallucinations. All kinds of subjective symptoms present, dryness of the throat, praecordial anxiety, with loss of sight, taste and hearing; the pupils are wide and inactive.

In very severe cases, epileptiform convulsions occur with exophthalmos and loss of consciousness, with loss of all reflexes, coma and death by paralysis of the respiratory center. As before stated, it is the presence in a given volume of circulating blood of a concentrated solution which is carried to the vital centers, which produces the dangerous symptoms and the avoidance of that is to be sought by the following means, except in cases of idiosyncrasy, and that we cannot control except by the history of a previous poisoning.

First: By the use of weak solutions of novocain. A solution

stronger than 2% should not be used and usually a $\frac{1}{2}\%$ is strong enough except in the most difficult cases.

Second: The injection should not be made into a vein. This can be avoided by moving the needle backward and forward during the injection.

Third: The addition of suprarenal extract to the solution. Klapp, Braun, and others have shown that suprarenal extract greatly retards its absorption, enhances the anesthetic by prolonging its action and as it intensifies the anesthesia, much weaker solutions can be used, furthermore it produces a more or less bloodless field.

Too much suprarenal extract, however, should not be used as symptoms such as feelings of oppression, palpitation, and increase in pulse rate, rapid and deep breathing may be caused by it. These, however, are evanescent and not serious as its injection beneath the skin does not raise blood-pressure as it does when it is injected into a vein, and follows the injection of $\frac{1}{2}$ cc. or more.

Fourth: One should not inject the anesthetic solution into an abscess for by so doing the septic material and organisms may be forced from their comparatively benign location into the blood or lymph-stream and set up a similar pathological condition in other parts of the body. Syncope not infrequently ensues at the beginning or even before the operation, this psychic shock presents symptoms which are very similar to a light toxemia from the drug and can be avoided by having the patient horizontal in the chair or on the table, and the avoidance of fear by morphine-scopolaminè, if necessary, for Crile has shown that this psychic shock is deleterious. One can usually distinguish between them as a fainting is usually preceded by some nausea, a blanched face or cold perspiration. Nervous, fearful patients if they will not yield to reason and more or less hypnotic influence, may be given chloral hydrate with potassium bromide each xv gr. an hour or so before the operation. Morphine gr. $\frac{1}{6}$ with scopolamine gr. $\frac{1}{150}$ may also be given if the case warrants it one hour before, this is frequently done preceding the more serious operations, such as resections of the jaws, removal of carcinomatous growths of the mouth, etc.

If the prodromal symptoms of syncope develop, all that is necessary is to place the patient in a horizontal position or even place the head lower than the plane of the body, ammonia, smelling salts, or amyl-nitrite may be inhaled if necessary.

If it is evident by a more rapid onset and increasing depth of toxemia, even with the patient horizontal, that the trouble is due to the poisonous effects of the anesthetic the treatment should be symptomatic as there is no chemical antidote for novocain.

The cerebral anemia is counteracted by lowering the head and breaking a pearl of amyl-nitrite in a piece of gauze allowing the patient to inhale it.

If convulsions supervene ether narcosis is indicated, to be *stopped just as soon* as the convulsions are over, if longer continued it is harmful.

The collapse which follows the convulsions indicates the need of stimulants $\frac{1}{2}$ cc. of camphorated oil, may be injected subcutaneously or as Fischer advises, 5 to 7 drops of Validol internally, black coffee also per rectum or per os, if the patient can swallow, rubbing the skin and keeping the body warm should not be neglected.

Local anesthesia may be induced by infiltration of the tissues to be operated upon or by inhibiting the conduction at any point central to the site of operation, not infrequently a combination of both may be necessary as in some operations upon the lower jaw.

For infiltration a weaker solution and more of it is used than for the conductive method. Given an isotonic sterile solution containing a small amount of suprarenal extract, we will consider the technique of its injection. For operations within the mouth and on the face one must consider whether it is possible to anesthetize the field of operation by infiltration or whether he must resort to the conductive method and whether the part involved is supplied by one or more nerve-trunks, all of which must be injected, as, in the jaw, floor of the mouth and tongue, in such case one must inject the lingual, inferior dental and the buccinator branch which arises from the second branch of the trigeminus. If the chin, lip, and jaw of one side is involved one must inject the inferior dental nerve of the same side and the nerve of the other side either within the mental

foramen or at its site. For operations upon the face one frequently infiltrates the tissues about the proposed site of operation, using a long needle and remembering the location of nerves supplying the part, in this way the anesthetic encounters the nerves before they break up into their terminal filaments.

A complete resection of the upper jaw may be accomplished by injecting the second branch as it leaves foramen rotundum, but most operations such as extractions, resection of roots, operations upon cysts, and operations involving the antrum can be done by infiltrating the bone. A study of a skull reveals many small foramina through which vessels pass. It is through these small openings that the anesthetic must be *slowly* forced using a strong syringe and a blunt pointed needle, the needle being passed *beneath* the *periosteum*. The number and size of the foramina differ in different skulls and at different ages, but there are areas of the bones in which they are fairly constant. We are indebted to Fischer for having perfected this method of bone infiltration. In the maxillary bones as a general rule the younger the individual the larger and more numerous are the foramina. The alveolar ridges are always porous, also the incisive fossa.

The cancellous areas decrease toward the molars, but above the bicuspid they are quite plentiful, the tuberosity is especially porous. The palatal aspect anteriorly shows very numerous perforations and while toward the molars the perforations are not so numerous it does not matter as the injection in this region is directed toward conductive anesthesia by blocking off the posterior palatine nerve as it courses downward in the posterior palatine canal.

It is reasonable to suppose that the maxilla can be readily anesthetized, and so it is if one keep in mind these foramina. The syringe armed with a short bevel needle of sufficient length is held in the pen grasp with the bevel point toward the bone, after sterilization of the mucous membrane with tincture of iodine the needle is inserted *beneath* the *periosteum* a greater or less distance and the necessary amount of the anesthetic is slowly forced into the bone, being very careful *not to elevate* the *periosteum* and cause *swelling*. This must be done both upon the palatal and buccal or labial aspects.

A great many of us are too impatient and will not take the time for the anesthetic to act; eight to ten minutes should elapse before beginning the operation, and the anesthesia will last from 20 minutes to one and one-half hours. To be more explicit, for anesthesia of the central incisor, insert the needle about the middle of the lateral root, directing it upward and forward even to the region of the nasal spine if both centrals are to be included, if for the lateral, enter the needle posterior to the lateral, passing it upward and forward to a point over the apex; if for the lateral, cuspid and first bicuspid, enter the needle at a point over the middle of the root of the first bicuspid, passing it forward and upward, then upward to the infra-orbital foramen, then backward and upward over the apex of the second bicuspid, this combines the conductive with the periosteal method.

For the second bicuspid enter the needle over the middle of its root passing it upward and little backward, and in the same manner for the first molar; for the second and third molars pass the long needle well up over the outer surface of the tuberosity causing conductive anesthesia. The third molar can be anesthetized by passing the needle to a point over its apex, all this for the labial and buccal surfaces. For the palatal injection, avoid injection into the anterior palatine foramina and pass the needle, bevel toward the bone, entering, not at the gingival border but above it, parallel to the process, carrying it beneath the periosteum, beneath the apex, of *each* tooth to be anesthetized, this applies to all teeth except the molars which are blocked off by injecting the nerve either in the palatine canal or as it courses along the groove, $\frac{1}{8}$ to $\frac{1}{4}$ cc. of the solution suffices for the palatine injection.

The posterior palatine foramen usually lies above the lingual root of the last erupted molar.

THE MANDIBLE.

The anesthesia of the lower jaw and teeth requires a somewhat different technique, as a study of the mandible will show. The inferior dental foramen on the inner side of the ramus is quite accessible from the opposite angle of the mouth, the area about it is occupied by loose areolar tissue through which courses the inferior dental nerve, and deposition of an anesthetic

solution within this space inhibits sensation within the area supplied by it.

The lingual nerve lies a little toward the median line and just beneath the mucous membrane, it supplies the floor of the mouth and tongue and may be anesthetized during the injection of the inferior dental as it lies very close to the tract of the needle.

The point of injection is about 1 cm. above the occlusal surface of the molars. With the left index finger one can palpate the two bony ridges, i.e., the external and internal oblique lines of the ramus. With the syringe held as one would grasp a pen and the barrel of the syringe resting upon the cuspid or bicuspid of the opposite side, the bevel of the needle toward the bone, the point is inserted close to the finger nail about 1 cm. above the plane of the occlusal surfaces of the molars and just internal to the internal oblique line, the needle is advanced, the injection being begun just beneath the mucous membrane if the lingual nerve is to be injected, along the periosteum but *not* beneath it, sliding over it to a depth of about 1.5 or 2 cm. here 2 cc. of a 2% solution is deposited, for the lingual nerve $\frac{1}{2}$ cc. In about 3 minutes the lip on the injected side tingles and begins to feel swollen but anesthesia is not complete for about 20 minutes and lasts about an hour, when sensation gradually returns. If the buccal gum and mucous membrane of the cheek about the first and second molars and second bicuspid is to be anesthetized it is also necessary to inject a few drops of the anesthetic beneath the mucous membrane just below Stenson's duct as this area is supplied by the buccinator branch from the second division.

If the operation is to include the middle line of the chin one must inject a few drops of the anesthetic into the mental foramen of the opposite side because of anastomosing branches from that side; mucous or sub-periosteal anesthesia is used as an adjuvant to conductive anesthesia in the lower jaw.

A study of the bony mandible will reveal a different disposition of the foramina consequently a different technique for sub-periosteal anesthesia is necessary. Its inner surface presents a smooth hard surface through which it is impossible to force any solution, only at the genial tubercles and at times above them are there any foramina.

Upon the facial surface also we note the absence of the foramina except near the border of the alveoli and in the mental fossaë. Looking down upon the alveolar arch one sees the whole surface or border of the alveoli, both inner and outer marked by the openings into the cancellous portion of the bone; it is evident then, that in order to anesthetize the teeth of the lower jaw the injection must be beneath the periosteum along the alveolar border, with the exception of the lower centrals and laterals where the injection may be made into the mental fossaë. In detail, to anesthetize the lower teeth from second bicuspid to second bicuspid inclusive one passes the needle horizontally along the outer alveolar border of the tooth or teeth to be operated upon, the bevel toward the bone beneath the periosteum injecting very slowly and causing no wheal. The six lower anterior teeth may be anesthetized by injection into the mental fossaë. To do this retract the lip and enter the needle at about the level of the apex of the cuspid, carrying the needle downward and forward toward the median line, injecting as the needle is passed, depositing about 1 cc. into the mental fossa. The lingual surface is anesthetized by injecting behind the central incisors and between the cuspid and bicuspid.

If several teeth are to be anesthetized it is best to inject the mandibular nerve at its entrance to the bone. For the lower molars the needle is inserted beneath the periosteum of the alveolar border and injecting as it advances to a point opposite the middle of the tooth to be anesthetized using 1 or $1\frac{1}{2}$ cc. For lingual injection of lower molars the needle is passed into the cervical margin of the gum of each tooth to be anesthetized and about $\frac{1}{4}$ cc. injected.

In all sub-periosteal injections one should press the point of injection a few moments to assist diffusion.

The Perfection syringe which is supplied with different length, short bevel needles, and different angle needle holders, is the one which will give most satisfactory results.

I have outlined only the most salient features of local anesthesia but the practice of them is an art which can be attained only by practice and judgment and one should not be discouraged if he fail at first or even succeed in obtaining only a partial anesthesia, remembering that he must give the anesthetic

time to act and watch the anesthetized patient for signs of toxemia.

What I have said applies primarily to oral surgery and extractions, but there is no reason why local anesthesia should not be used to render the preparation of cavities painless, also for other procedures which involve pain.

One should not forget, however, that the pain sense is the patient's chief safeguard from danger, and simply because he does not feel it does not give you liberty to traumatize his tissues any more than does a general anesthetic give the surgeon liberty to sever the recurrent laryngeal nerve in removing a goiter, or injure the facial nerve because there is pus in the mastoid which must be drained.

One should by all means avoid injury to the pulp and gum tissue for reasons known to all of you.

In the treatment of live pulps under anesthesia or analgesia one can, and should, avoid serious consequences by accurate diagnosis as to the condition of the pulp before attempting anesthesia. All of you have been surprised ere now when upon uncovering a pulp you observed a tiny drop of pus upon it. In my opinion such a pulp will usually die sooner or later and it is better to take time by the forelock and remove it. If analgesia or anesthesia is induced in a rather slipshod routine in such cases the diseased pulps will in many cases be overlooked to the despair of both patient and dentist.

Diagnosis should be first, whether it be hypermia, pulpitis, suppuration or necrosis, and *after* having outlined your treatment, resort to anesthesia or analgesia if necessary.

Pulps have been deprived of their nutrition and have necrosed from the action of cocaine which constricts blood vessels, novocain produces no such contraction. Suprarenal extract will in too concentrated solution produce a fatal ischemia but in proper dosage 1/1500 to 1/1000 it is perfectly safe.

On account of the ischemia so produced the careless operator may expose a pulp unawares, not seeing the little drop of blood which would appear upon injury to one normally filled with blood.

Local injection has its place in cavity preparation and should be used but only after a diagnosis of the condition of the

pulp has been made. Its technique is not easy and is mastered only after much experience.

In the preparation of this paper I have drawn liberally from the works of Fischer, Braun, Reclus, Schleich, Bier, Piquand¹² and others.

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²Schmerzlose Operationen, 1899.

³Über Lakalänesthesie Deutsche Klinik 1901.

⁴Local Anesthesia 1886. N. Y. Medical Journal, P. 9518.

¹⁰The Growing Importance of Local Anesthesia. Louisiana State Med. Soc. Trans. 1900.

⁵Rückeumarksanästhesie. Münchener Med. Wocheusche. 1904-No. 14.

⁶Die Lokalauästhesie.

⁷Prinz.

⁸Local Anesthesia in Dentistry.

⁹The Kinetic Theory of Shock and Its Prevention Through Anoci-association. London Lancet July 5, 1913.

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¹²Précis D'anesthésic Locale.

THE PROPER MANIPULATION OF AMALGAM.*

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This paper, on the proper manipulation of material, and technic necessary for amalgam fillings, is formulated as a result of four years' work with the air pressure apparatus as a test for these requirements and adaptation; with tests of the same alloy on the micrometer for purposes of comparison.

The excellent, and, at other times, disappointing results which time develops in some of the amalgam work made with the most reliable micrometer tested alloys and by the most skilled operators, indicates most emphatically either a lack of knowledge or failure to uniformly carry out the proper technic in the mixing and making of our amalgam fillings. This alone is sufficient reason for the presentation of this paper on such an important subject.

* Read before the Wisconsin State Dental Society, July, 1914.

I would urge the great importance of strict attention in the reading and carrying out of the details emphasized in this outline, and if these directions make sufficiently clear and emphatic the important details of technic which I have aimed to present, much will be accomplished in the direction of greater uniformity and stability in our amalgam work.

In the paper and report I presented to the Illinois State Dental Society, published in the proceedings for the year 1912, also in the December, 1912, issue of the DENTAL REVIEW, I expressed my great surprise and mortification at the inconsistent results attained by the use of our well known alloys, and the methods of technic as generally taught and practiced, as measured by the air pressure apparatus. This report was the result of 400 tests I had made with 15 of the best known alloys at that time on the market.

In this work I have used every amalgam procedure, technic, and instrumentation, with which I am familiar, with such modifications as I could think of as possibly affecting or improving the result.

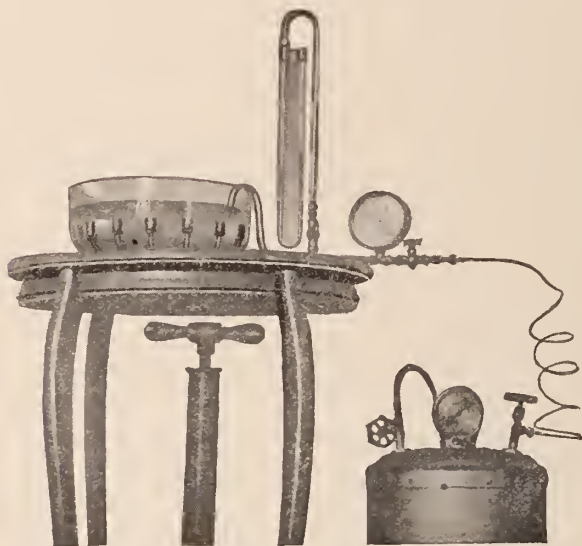
My experimental work has been continued since that time and I feel sufficiently encouraged in the results attained to make a brief report of my progress.

As stated in my previous contribution above mentioned, my first experimental amalgam fillings made for the air pressure test proved to be extremely poor, and continued so while using the technic generally taught and practiced, viz.: Mixing thoroughly, removing the excess mercury during the final kneading (leaving the amalgam mass sufficiently plastic to take the fine skin markings) the use of as large a plugger as the cavity will conveniently permit for the general packing and a small plugger for packing in the angles.

Examination of that surface of my fillings packed against a solid matrix revealed many pronounced defects visible to the naked eye. These air spaces or defects were most commonly found around the buccal, lingual, and gingival margins of my test fillings in those angles formed by the junction of the cavity walls with the matrix. I found it practically impossible to eliminate these imperfections until I abandoned the use of the large pluggers (thirty-tenths of a millimeter in diameter or

larger) for the general packing, confining their use to the simple flattening of each piece of amalgam, then packing the entire surface with an angular plugger of the approximate size of twelve by eighteen tenths of a millimeter in diameter, using all the force of the pen grasp and paying particular attention to the angles of the cavity; confining my effort at all times to such technic as would be possible in the mouth.

With the great improvement resulting from the use of the small plugger for the general packing, in which these common defects were practically eliminated, as far as the naked eye could observe, I had great hopes of materially improving the adaptation

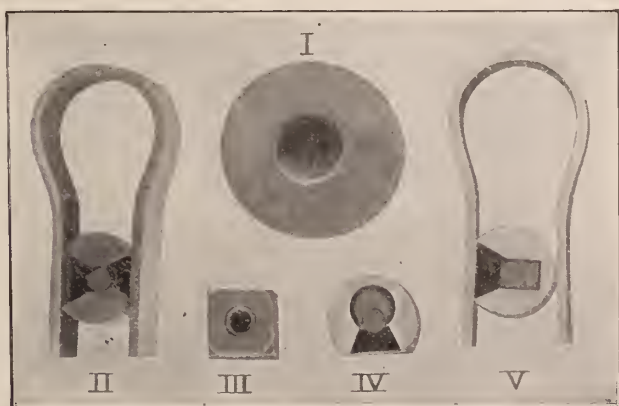


AIR PRESSURE APPARATUS FOR TESTING ALLOYS.

to walls of my test fillings, but was sadly disappointed to find the same inconsistency of results in adaptation when the fillings were subjected to the air test. I then tried various forms of plugger, triangular, diamond shaped, round and square, trying each form in flat serrated faced and convex serrated faced, also smooth faced, in all of these forms and the use of ball burnishers, none of which showed results equal to those following the use of the small flat serrated faced plugger. I am satisfied that the profession will find it impossible to avoid the common defects

mentioned except by the use of a small plugger for the general packing or by adopting the procedure as presented in this paper, particularly that detail of extreme plasticity bordering on sloppiness, during the packing.

In all of my experimental work it was gradually impressed upon my mind that I more often secured a good test following the use of what I would describe as a semi-sloppy mix. This was true in my own work as well as in the test fillings made for me by other operators in my office and under my observation. In trying various formula, and alloys on the market, I would



TEST CAVITIES.

No. 1. A simple, round cavity in which the same filling is measured on the micrometer and under air pressure to note the relation of adaptation to movement. No. 2 shows a mesio-disto-occlusal cavity. No. 3 a small, shallow, simple, round cavity, for gold or amalgam tests. Nos. 4 and 5 show a mesio and disto-occlusal cavity. These cavities are such as are filled in every day practice. Cavities Nos. 2 and 5 show the matrix in position.

occasionally find one that, notwithstanding the apparent removal of the excess mercury during the final kneading; would become unusually plastic or somewhat sloppy during the packing, with a considerable amount of mercury to be expressed during the operation, following the use of such a mix I would more commonly secure a good test.

These observations resulted in a long series of tests which indicated that the character of the plasticity of some alloys was more favorable to adaptation than the same apparent consistency

of the mix would show in other alloys, and as a result of these tests I believe this to be true.

In the use of any of the well known high grade alloys, all of which may be considered sufficiently resistant to crushing stress and flow, the character and permanency of the adaptation are the important factors which make a good or bad amalgam filling. Our progress in this direction has been at a comparative standstill for want of a measure of these supreme essential qualities, but the great need has been reasonably well provided for by the invention of the air pressure apparatus by Dr. C. C. Southwell of Milwaukee, Wis. This testing device will expose the defects of either gold or amalgam fillings whatever the cause, and it is for us to decide by extensive and intelligent experimentation whether the variable results attained in this work be due to the alloy or to the faulty amalgam technic.

After twenty years' work with the micrometer, and four years' work with the air pressure apparatus I do not hesitate to state that the air test is the only accurate and practical measure at our disposal at the present time to determine the character of the adaptation of our fillings, and as evidence of this I beg to offer the following comparative test selected from many of the same kind in which a considerable range of movement is shown without a material disturbance of adaptation.

ALLOY A.

Micrometer test.	Mesio-occlusal cavity.	Air test.
First record—230	One hour after packing.....	leaked at 15 lbs.
Second record—229	Three days after packing.....	leaked at 8 lbs.
Third record—332	Thirty days after packnig.....	leaked at 35 lbs.
Fourth record—337	Fifty days after packing.....	leaked at 35 lbs.

The quality of adaptability is an imperative requisite in our alloys and must be considered separately and distinctly from the quality of shrinkage and expansion. Test fillings made by competent operators, using alloys that show no movement on the micrometer, leak as commonly under one pound air pressure as do test fillings made with alloys that show a considerable range of movement. Many test fillings made with alloys that shrink as much as one point or expand as much as six and eight points on the micrometer, showed perfect adaptation under pressures of 20 to

40 pounds and continued to do so throughout the time of movement as shown by repeated tests. An example of which is given. These observations may be partly explained by the fact that the amount of alloy used for filling a micrometer test tube, which contains 60 grains, is about three times the amount used for the air pressure test containing about 24 grains, necessarily making a corresponding proportionate increase in the movement, it must be remembered too, that the micrometer test tube is a simple round cavity, about $\frac{3}{8}$ of an inch deep, with unyielding walls and any movement will be in but one direction only, and therefore will be an exaggerated movement. The cavity form used for the air pressure test is of more practical size and form being representative of an average large amalgam filling in the mouth, as it is unnecessary to make an excessively large filling to be able to record its faults. Any defect sufficient to permit lodgement of micro-organisms will be exposed by the searching and penetrating air, particularly when subjected to pressure.

There are many other reasons to explain why a considerable range of movement as shown on the micrometer may be insufficient to disturb the adaptation in the much smaller mesio-occlusal cavity used for the air test, for instance, the change in the bulk form of the filling and the change in the cavity form, both of which would probably favor a reduction in the movement, and a general distribution of that remaining. I feel called upon to attempt some explanation as to the reason for an 8 point expansion in the micrometer test tube, which is very plainly seen when examined under the binocular microscope, in fact, it is frequently visible to the naked eye to those experienced in the work of testing alloys. And when fillings are placed in the teeth the elasticity of the tooth structures must be considered as an important factor, as this elastic force is developed by the wedging into the cavity of the filling material as a result of the force used in the packing.

The quality of adaptability and adaptation of gold foil and of gold fillings cannot be measured on the micrometer, as gold neither shrinks nor expands. The poorest gold filling placed in a cavity would show a perfect record on the micrometer, but this does not prevent leakage resulting from the use of a harsh working foil, or from faulty manipulation or the many other causes. The micrometer is a measure of movement only and not a measure of

adaptation. To further emphasize the unfitness of the micrometer as a test of our fillings I refer the reader to tests under Group 2. With these explanations and comparisons I feel justified in the adoption of the air pressure apparatus as the test for adaptation of our fillings, whether gold or amalgam, confident that the profession will extend its approval when the merits of this testing device are known.

To best express the improved adaptation that may be secured by the procedure described in this outline as a result of my experimental work, I offer from my records a group of tests Group 2, for comparison, showing micrometer and air tests of the same alloy. Four fillings were made by each operator, for the air test with exactly the same technic, except that in the tests under the heading A, the excess mercury was removed during the final kneading, leaving the amalgam sufficiently plastic to take the fine skin markings, and in the tests under the heading B, the excess mercury was not removed during the kneading but was removed as expressed to the surface during the packing. In the "air tests" column the figures indicate the number of pounds pressure at which the fillings leaked, those marked * did not leak at the pressure indicated.

GROUP NO. 2.

Micrometer tests.				Air tests.			
				A		B	
Three duplicate tests of the same alloy used for the air test.				Mercury removed during the		Mercury removed during the	
				kneading.		packing.	
	Test 1	Test 2	Test 3				
1 hour after packing.....	375	341	360	Dr. A	1 1	10	20*
1 day after packnig.....	374	340	360	Dr. B	6 20*	20*	20*
7 days after packing.....	374	340	359	Dr. C	2 5	20*	20*
30 days after packing.....	374	340	359	Dr. D	1 20	20*	20*
60 days after packing.....	374	340	359	Dr. E	20* 3	4	20*
120 days after packing.....	374	340	359	Dr. F	20* 1	18	20*
				Dr. G	14 2	20*	20*
				Dr. H	1 1	20*	20*
				Dr. I	5 14	20*	20*
				Dr. J	2 4	20*	20*

Whether the excess mercury be removed during the kneading or during the packing appears to have no effect when measured by the micrometer. In test No. 1 the mercury was removed during the final kneading; in tests 2 and 3 of the micrometer record, the mercury was removed during the packing. A comparison of the above results under A and B of the air tests indicates the error of our present procedure in removing the excess mercury during the kneading. And all such comparative tests that I have made are as decisively in favor of the removal of the mercury during the packing.

The operators making the tests A and B had already learned by experience with the apparatus the influence of the removal of the excess mercury during the packing instead of during the kneading, and I observed that during the packing of the fillings under A some of the operators had failed to remove the mercury, leaving much in excess to be removed during the packing. This possibly accounts for some if not all of the good tests recorded in group A as the knowledge of what the results would be inclined some to take a little advantage either consciously or unconsciously of such a situation in the interest of a better test.

The removal of the excess mercury as directed in this paper during the packing instead of during the kneading is contrary to general practice and to the recommendations of amalgam authorities. But this procedure appears to have a most marked effect in greatly improving the character of the adaptation to cavity walls, and in all of my experimental work it is the only technic with which I have been able to secure results in adaptation. These results when made in round cavities, appear to be so positive to all who have participated in the work, as to eliminate all doubt in the necessity of this procedure. I have failed to find any disadvantage in my test fillings as a result of the change, as fillings so made are equally resistant to crushing stress and flow. In other words it does not seem to be important to the strength of the finished filling that we remove the excess mercury during the kneading and the air test shows conclusively that this extra plasticity is absolutely essential to obtain uniformity of results.

In discussing this phase of the operative procedure with those who have not had the opportunity of seeing a clinic or demonstration I have generally found that they immediately conclude that

an amalgam filling so made will be a weak filling and the resistance to crushing stress and flow will be materially reduced, none of which is true, because the excess mercury which gives to the mix its plasticity is removed in the packing of the filling.

If the packing is done with all of the force of the pen grasp and while the amalgam mass is in a condition bordering on sloppiness it will be found that as soon as sufficient compression is made to pack, the excess mercury is expressed to the surface and may be scraped off with the side of the plugger. The remaining filling will be harder and more solid than when packed by removing the excess mercury during the kneading; the amalgam will set as quickly; and the weight of mercury removed during this procedure will average quite as much if not more, than when completely removed during the kneading as generally practiced.

I have been mixing amalgam as thoroughly as described in this outline for about ten months, and by comparing my records with those of my test fillings made by mixing one-third to one-half the time herein mentioned as being necessary, there is a very decided indication of greater stability in adaptation, in fact sufficient to justify the recommendation that more time be taken for this purpose. The operator cannot judge the completeness of the mix or amalgamation by appearance or the feeling of the consistency. In the proper fusion of metals in the crucible fusion is apparent long before the process is complete and the element of time must be considered and allowed.

Compression has been named as one of the key-notes to perfect adaptation and I thoroughly concur in its importance, after my experiments with the flat and convex smooth faced pluggers. A large flat serrated faced plugger is the proper form as it will more perfectly grasp and hold the amalgam under the packing force permitting the maximum compression. The necessity for compression demands the use of a solidly fixed matrix in those cavities where one or more of the surrounding walls are missing.

Proportions: The proportions of alloy and mercury necessary to make a proper mix of amalgam vary in different alloys. Such proportions are usually found in the printed directions accompanying the alloy and should be rigidly followed, unless the experience of the operator has necessitated a slight change.

That these proportions be correct, is quite imperative, for an insufficient amount of mercury results in an incomplete mix due to lack of free mercury which the alloy needs. But on the contrary, if an excess of mercury be used, the filings glide around or float in the mercury, which inhibits its being properly rubbed into the alloy by moderate friction as it should be. It is the opinion of the highest authorities, as well as the experience of the profession at large, that the use of a slight excess of mercury facilitates amalgamation and is in no way injurious, provided such excess be removed before the completion of the filling.

This is more advantageously accomplished, by following the method as directed in this paper, in which the excess mercury is expressed to the surface and removed during the packing of the filling, than in following the usual method of expressing the excess mercury by pinching between the thumb and finger during the final kneading.

For convenience sake, capsules filled with 10 grains of alloy, and others containing the proper proportion of mercury should be carefully weighed and filled by the assistant or operator when opportunity affords. Convenience, however, is not the only advantage to be derived from such procedure, for it will also result in an astonishing saving of material, especially, as the operator learns to estimate closely the amount required when handling the alloy in definite quantities. For instance 10 grains, or one capsule is recommended as a desirable amount which may be used for a small cavity; two capsules for a cavity of medium size; and three capsules for a large cavity.

Mixing: Proper mixing is best done by the use of a deep glass mortar, the inner surface of which has been slightly dulled (not ground) and pestle of such design as to afford a firm grasp being taken of its handle. The head of the pestle should also be slightly dulled. The time required, and the rapidity of movement of the pestle necessary for thorough amalgamation, make the use of the shallow mortar impracticable because of the danger of loss of some of the contents during the operation. A rough inner surface of the mortar tends to grind the alloy, which is objectionable to say nothing of the extreme difficulty in completely removing the plastic mass, and keeping the mortar clean.

Mixing in the deep glass mortar should be done thoroughly by a rapid movement of the pestle in such manner as to keep the mix always at the bottom of the mortar, this will necessitate the constant rubbing or shaking down of that portion which collects on the sides. The force exerted in mixing should not be one of grinding, but of moderate rubbing together, to accomplish the most complete amalgamation. Such mixing should be continued for two minutes by the watch as a minimum length of time, followed by kneading the mass in the hand one minute, this time requirement applies to all mixes made of from ten to thirty grains of alloy, but a mix of less than ten grains might require a little less time, and a mix of more than thirty grains will require more time. Some alloys may possibly require a little more time for mixing but never less,—I am speaking of the high grade alloys containing 65 to 73 per cent of silver, as these are the only alloys worthy of consideration.

If the proper proportion of alloy and mercury have been used and the necessary time and thoroughness have been taken in the amalgamation, the mass will show a degree of plasticity indicated by slight sloppiness, a condition of plasticity most favorable to uniform results in adaptation to cavity walls.

The mass should not, however, be so plastic as not to retain its form when made into a roll, as such a condition is considered excessively sloppy. If, in the final kneading any crepitus or indication of setting is felt, the mix is unfavorable to adaptation except for very small cavities.

Uniformity of results in adaptation to cavity walls appears to be more dependent upon the condition of plasticity during the packing than has been recognized. These observations are the result of extensive experiments with the various well known alloys, and it is not surprising that they have been conclusive to those operators who have participated in the work, especially when results such as are shown under tests Group No. 2 are uniformly encountered.

My records show that at least ninety per cent of the operators whose work has come under my observation, make an incomplete mix, due in almost every instance to insufficient time being taken, and to the limitation of rapid rubbing which the use of a shallow mortar or only a hand mix affords.

This incomplete amalgamation is probably the cause of those bulk changes which time develops in some of our fillings, and this faulty technic may also explain many discrepancies in reported tests recorded on the micrometer which do so many of our reliable manufacturers a great injustice.

Packing.—The packing should be done with flat serrated faced pluggers, only a very limited number being necessary to meet the full requirements of an every day practice. The following selection is suggested as sufficiently complete, viz:

A large plugger 3 to 4 millimeters in diameter.

A medium sized plugger, 2.5 millimeters in diameter.

A small plugger of the approximate size of 12x18 tenths of a millimeter in diameter, made in some angular form to reach well into the angles of a cavity. Such measurements are of course approximate and may be varied to suit the desires of the individual operator.

The character of the plasticity of the amalgam at the start and during the packing is an important factor, and is absolutely essential to gain reasonably uniform results in adaptation. This condition of plasticity with compression appear to be the vital requirements in our procedure, without which I have at all times failed to secure uniform results in all of my experimental work during the past four years. This has also been the experience of all of those who have assisted me in making the tests.

To continue with the packing, take a piece of the very plastic amalgam sufficiently large to cover the floor of the cavity and pack with all the force of the pen grasp, using as large a plugger as possible, taking short steps in concentric order, working from the center of the filling to and around the walls. Remove the excess mercury as it appears upon the surface, repeating the operation as each piece of amalgam is added until the filling is completed. The excess removed during the packing may be used for the finishing of the filling by pinching out the excess mercury. In cavities of irregular outline form, the small angular pluggers must be used to reach well into the angles or irregularities and in so doing great care should be taken to adopt some order of stepping that will insure the use

of the small plugger on every part of the surface not reached or condensed by the use of the larger plugger.

The filling should be finished with an excess and allowed a few minutes to set, after which the filling may be trimmed to form, to be polished at a subsequent sitting.

Three details of technic appear to be equally important and essential to secure uniformly perfect and stable adaptation, namely:

First—Thorough mixing, for greater stability, and a decided plasticity of the mix during the packing to make possible reasonably uniform results.

Second—Compression made possible only by the use of the flat faced serrated pluggers, and the use of the matrix if any of the surrounding cavity walls are missing.

Third—An order in the stepping of the plugger which will insure covering the entire surface of the filling, with special attention paid in packing against the walls and in all of the angles of the cavity.

There is much work yet to be done in the direction of improving our amalgam fillings as the character of the adaptation made possible by this technic in the proximo-occlusal cavities is decidedly inferior to that attained in the simple round cavity.

The general packing in proximo-occlusal cavities must necessarily be done with a small plugger, and in such irregular cavities it is very difficult to carry out an order in the stepping of the plugger point that will insure complete condensation. The use of a small plugger is not as favorable to compression of the mass as is the use of a large plugger, because the condensing area of the small pluggers is so reduced as to fail to grasp the amalgam with the result that it crawls from under the condensing force and the mass is more or less chopped up. Enough work with the small plugger will eliminate the naked eye defects, but fails to compress the amalgum into solid adaptation. To overcome these technical difficulties inspires to a continuance of the work.

FURTHER STUDY AND REVIEW OF CERTAIN DISEASES AFFECTING THE JAW BONES—WITH REPORT OF CASES.*

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A review of dental literature pertaining to diseases of the mouth, and the many reports which indicate that the ills of man are primarily due to these local manifestations, seem to impress many dental practitioners with the belief that mouth diseases are of primary origin. It is not at all strange to find men here, there and everywhere, who maintain that a morbid condition of the oral cavity is the etiological factor in all forms of systemic conditions. So firm has this gross misrepresentation been rooted into our profession that dental societies spend hours in its discussion, and journals devote pages to reports. Not that alone, but out of this chaotic dental exaggeration the public has been led to believe that a guarantee to health is dependent on a dynamic revolving tooth brush, and the spray of a commercial mouth wash. I come here fully realizing that many diseases of the mouth are the primary causes of many systemic conditions; but I do not maintain that all diseases of the mouth are of local origin, and so I will endeavor to show that if we wish to uphold the dignity of dentistry, we must look further than the treating of gums with an iodine swab, and manicuring the teeth with pumice stone and an orange stick.

Strange as it may seem, our profession seems to live in an atmosphere of dental provincialism. I do not wish to imply that dentistry is not progressive; far be it from that. I fully admire, almost with a sense of sacredness, the work of pioneers, who have forged dental ideas from the empirical to that of an exact science. Let us regard Flagg, Garretson, Kingsley, Miller, and many others, as the pillars upon which our success depended. It is fortunate that in all walks of life we find men whose sacrifice of money, time and health has been the stimulant of slow and progressive growth.

The spirit of such men remains with us when we comprehend in reading their biographies, the trials and tribulations they endured in blazing the way through a forest of dental ignorance. That the

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growth of dentistry owes much to such men cannot be questioned; but we must not forget that while our profession, with its large army of workers, is rendering splendid service to humanity, its accomplishments, its results, its deeds, can be improved upon to a great extent. In other words, the methods of today practiced by the majority of dentists are speculative. This, I believe, is largely due to the fact that the connecting link between medicine and dentistry seems wanting.

Medicine and dentistry have been most closely associated since the very earliest times; in fact, down to the seventeenth century, dentistry was practiced almost exclusively by physicians. Later it was practiced by men who had not been trained as physicians or surgeons and their numbers have gradually increased up to the present time. This is in itself a matter of regret, but what is certainly far more to be regretted is that in a similar manner, interest in the teeth and jaws on the part of the physicians and surgeons has gradually diminished. Dentistry, therefore, ignorant of the advance in medicine, has drifted along fighting its own battles, while medicine, on the other hand, has progressed with a corresponding ignorance of the accomplishments in dentistry. Granting this to be true, there remains for study and research the unexplored land of the "Great Divide."

While it is true that from a mechanical standpoint, dentistry is regarded as having achieved a high standing, it must be classed as dealing with the effect. In other words, it is a reparative process, which artificially restores, to a certain extent, the forces of mastication. But that alone does not remove or cure the cause. With our knowledge of bacteriology, chemistry, physiology, anatomy, etc., and I might further add, with our knowledge of the symptomatology regarding certain diseases affecting the mouth and their relation to systemic conditions, it is fitting and proper that we should strive to familiarize ourselves with the causative factors of diseases. Then, too, if we may not always understand the etiology, we should at least be familiar with the pathological conditions, so as to know when and where the disease ends. In other words, we should understand the gross and microscopic changes that take place during the progress of disease. With such an understanding we can prognosticate, for that completes diagnosing and treatment.

A thorough examination of the mouth by all available methods is of great value, not only in the study of diseases localized in, or confined to, the oral cavity, but also in the investigation of general morbid states. It is wrong for a dentist to confine his attention to the teeth only. A proper study of the oral cavity comprises inspection of the lips, gums, teeth, tongue, floor of the mouth, salivary glands, the mucous membrane, the saliva, the relation of the inclined planes, etc.

The oral cavity, being a part of the human anatomy, must be studied in its relation to the general system. Changes in the mouth, due to general disease, are not uncommon, in fact they offer many times valuable symptoms as an aid in rendering a complete diagnosis. Thus, for instance, in typhoid fever, the changes consists in ulceration, usually on the anterior faucial pillar, on the tongue, uvula, cheeks, lips and labiogingival folds. In diabetes the tongue is large, red (beefy), its margin fissured, the mouth unhealthy looking, and frequently complicated by a suppurative alveolar periodontitis. The support of the teeth undergo degenerative changes; the nutrition lowered with pus pockets harboring pathogenic germs. Such a clinical picture of the mouth, with the finding of sugar in the urine should always be diagnosed as diabetic gangrene of the mouth. The treatment in such cases is palliative. Patients with such a disease should not be encouraged or assured that a cure be made with the much advertised pyorrhea instruments, pyorrhea vaccine, and pyorrhea pastes. Oral prophylaxis with systemic treatment as palliative treatment, is fitting and proper. The prognosis in these cases is usually unfavorable.

THE LIPS.

In a healthy person, the lips are of a bright red color, very lightly wrinkled. The thickness varies in individuals. This is also true of the amount of redness exposed. Changes in the lips and mucous membrane are very common, and of much clinical interest. Cyanotic or blue lips are due to exposure to cold, in asphyxia, pneumonia, heart disease, and some forms of intestinal toxemia. Pale lips are found in anemia, hemorrhage, chronic parenchymatous nephritis and aortic stenosis. In diabetes there is usually found a striking redness of the lips. In jaundice a yellowish tinge. In lead poisoning the blue line along the gums and the patches on the inside of the lips. Brownish patches on the palate, lips, and cheek are a

diagnostic sign in Addison's disease. Observation of the lips and their changes during sickness offers, many times, valuable aid as a diagnosis.

OFFENSIVE BREATH.

The dentist should be encouraged to be familiar in recognizing the causes of offensive breath. Among the causes of this condition are: Lack of mouth cleansing, loose and poorly fitted crowns and fillings; diseases of the antrum, tonsilitis, local diseases of the mouth and caries of the teeth. The odor which resembles the smell of dried and decomposing blood or cadaverous material is sufficient reason to suspect cirrhosis of the liver. It is said to be due to the failure of the antitoxic function of the liver, and the consequent passage into the blood of poisons generated in the alimentary canal.

A sweetish breath is very common in diabetes. The odor is like the smell of an over-ripe apple. A urinous odor is found in uremia. An offensive breath causes suspicion of carcinoma of the larynx, bronchitis, abscess and gangrene of the lungs.

The treatment, of course, depends on the cause. I merely want to call your attention to the point that an offensive breath should be considered as a factor in making a diagnosis.

Time does not permit me to give a detailed report of the changes in the mouth due to general diseases. Typhoid fever, uremia, pernicious anemia, scurvy, locomotor ataxia, and skin affection such as urticaria, psoriasis, etc., oftentimes show abnormal conditions in the oral cavity, and the dentist should recognize these when called upon for a diagnosis.

While systemic conditions are responsible for many oral changes, yet the classification of oral diseases is a difficult one. For instance, the various forms of acute and, I might add, many chronic inflammations of the mouth show that while the etiology differs, the clinical picture shows striking similarity. Right here I want to call your attention to two cases which were admitted to my clinic at the Marquette University Dental School:

Mr. L., twenty-seven years of age; occupation, locomotive fireman. Complaint: Sore, loose teeth. Habits: Fair. Urinary analysis: Negative. Headache: Considerable. Loss of hair: Yes. Specific history: Doubtful. Blood pressure: Normal. Serum diagnosis: Positive Wassermann. Lower and upper teeth

loose, with gums swollen and angry looking, gums painful to touch, some discharge of pus from sockets, gums bleed easily, breath foul. Posterior teeth firm. Diagnosis: Syphilis producing suppurative alveolar periodontitis. Prognosis: Favorable. Treatment, salvarsan, intravenously, and curetment of teeth, with usual prophylactic treatment. Result: Cured.

Mr. J., sixty-five years of age; occupation cobbler. Complaint: Sore, loose teeth. Habits: Heavy drinker. Urinary analysis: Albumin and sugar. Headache: Considerable. Loss of hair: None. Specific history: None. Blood pressure: High. Serum diagnosis: Negative Wassermann. Teeth loose in both arches, anterior teeth very loose, with considerable pus discharging from sockets. Gums gangrenous and bleeding easily, foul breath, and unhealthy looking palate which was reddened and swollen. Diagnosis: Arterial sclerosis with interstitial nephritis and diabetic gangrene of the mouth. Prognosis: Unfavorable. Treatment: Palliative. Result: Patient died in diabetic coma.

These two interesting cases should demonstrate the importance of having a thorough understanding of the etiology, diagnosis, prognosis and treatment of the diseases and deformities of the oral cavity. Strange as it may seem, these two patients were under the care of dentists, yet at no time was an attempt made to find the real cause of the suppurative inflammatory condition of their jaws. In the young man, syphilis was a factor in causing his trouble in the mouth. In the old man, a complication of diabetes, nephritis, and arterial sclerosis produced the suppurative condition. No one could expect to cure these cases with scalers, brush and pumice-stone. Yet, strange as it may seem, the young man had consulted a number of dentists and each time was informed that he had pyorrhea.

One specialist of the so-called pyorrhea enthusiasts' class, who could not see farther than pumice-stone on the end of a stick, and whose knowledge of pathology would not cover a postage stamp, was seemingly trying to impress this patient, that if he would spend several hundred dollars he could effect a cure with his one hundred and eight instruments and his wonderful technique of removing tartar. Such a man almost reminds me of the young medical graduate who, through procrastination,

tainment and having a rich father to rely on, was not making much of a success as a medical practitioner; so he decided that a trip to Europe would fit him as a specialist. When he arrived at the Allgemeines Kranken-Haus, and was told that in order to be a specialist he had to knuckle down to hard, strenuous work, he was satisfied to let the other fellow use the microscope, while he enjoyed a student's visit to the beer table. After six weeks' sightseeing in Vienna, Berlin and London, he returned to his home town and introduced himself to the profession as a specialist with the following words:

I have just returned from o'er the sea,
Send your cases straight to me;
I am a specialist—yes, by Gee!
And I belong to the State Society.

Time does not permit of giving a full report of the many cases I have recorded wherein syphilitic patients with suppuration of the oral cavity had been for a long time under the care of a dentist. The dentist invariably, either through ignorance or carelessness, would not recognize the etiological factor of the patient's oral disturbance. I will never forget a case which indeed is a sad one:

In March, 1911, a young man called at my office, having been referred by a physician. He complained that his upper anterior teeth were sore and loose, with pus discharging from the nose. He was twenty-five years of age, head bookkeeper of a large mercantile house. This man had the appearance of coming from a good family; he was intelligent, refined, courteous, and handsome. He gave a history of having consulted a number of dentists, being informed each time that he was suffering from pyorrhea. He had had the roots scraped and the gums painted with iodine. Upon inquiry into the history of the case he admitted that he had had a chancre about three years ago and that he had taken treatment for syphilis for about three months.

Examination showed the septum perforated, the vomer and a part of the hard palate necrosed; the left central and lateral incisors very loose, with a considerable portion of the alveolar process destroyed. When I informed him that syphilis was the

cause, he was much disturbed; but when I told him that he was going to lose a large part of the palate and septum and two teeth, he wept bitterly and between sobs he begged pitifully for help. He offered everything he had if I would cure him without loss of so much tissue.

All this time I could not help thinking of the faulty diagnosis, viz., that the patient had pyorrhea! What a blot on the good name of Dentistry. What a pity that not one man of all the dentists he had consulted attempted to get at the bottom of his trouble and save him from being a cripple all his life. This man now walks the streets with the stigma of syphilis facing his friends. Fortunately, the opening was closed with an artificial palate constructed in gold, to which porcelain teeth were attached to take the place of the ones that were lost. This permits him to speak distinctly.

I do not wish to convey the idea that I am opposed to prophylactic treatment. I am a firm believer in the old adage that cleanliness comes next to godliness. But in this day of enthusiasm about mouth prophylaxis, many members of the dental profession are losing sight of the principles underlying the production of disease.

I have many times had the opportunity to see cases in which dentists administered local treatment by means of tooth-cleaning technique in patients who had a suppurative alveolar periodontitis, the patient being told by the dentist that he or she had pyorrhea because the teeth were loose and there was pus oozing from the gingival margin. Yet in many cases I have found that the patient was suffering from syphilis, and as a rule the patient would admit that he or she had some time in the past become infected, and had been under specific treatment. In others, serum diagnosis would tell the story.

Several months ago, Mr. W., forty-two years of age, machinist by occupation, was referred to my clinic, complaining of trismus dentium, with large tumor on the right side of the face. He gave the following history:

His health was fair, but he had always been suffering from loose teeth. In January, 1911, he called on his dentist to have a loose upper first molar extracted. A few days after the operation, he noticed a swelling in the region of the extracted tooth.

He called on his dentist, who referred him to a physician. Operation was advised, which was refused. The swelling increased rapidly, and in a short time it was of such a size that it prevented jaw movement. He now felt very weak, and had lost considerable in weight. Examination showed a tumor quite firm and immovable and painless upon pressure, except over the region of the maxillary sinus. Upon examination of the oral cavity I found all of the upper teeth lost, except the upper right first and second bicuspid, these teeth being very loose, with pus flowing from the gingival margin. A silver probe passed into the pus socket of the loose teeth would travel upward into the external surface of the maxilla. By probing, I could ascertain that there was considerable bone destruction. Upon inquiry into the history of this case, the patient admitted to me that he had had a chancre twenty years ago, but he denied having had secondary symptoms. A serum diagnosis was made, which showed a positive Wasserman reaction. The patient was then placed under the anti-syphilitic treatment, and within two weeks we succeeded in inducing the tumor to break down. The patient was operated upon shortly after. The right maxillary bone was found to be considerably necrosed. We therefore removed the entire degenerated mass and packed with gauze, which was later removed to allow the wound to heal by granulation. The patient made splendid progress, and ten days later was given an injection of salvarsan. He has made an uninterrupted recovery.

This patient for almost twenty years had frequently consulted a dentist in regard to his loose teeth, yet at no time was an attempt made to diagnose his case, except that he was told he had pyorrhea, just because his teeth were loose!

Attention is called to another case, as follows:

Mrs. S., twenty-seven years of age, noticed a swelling over the right second bicuspid. She consulted her dentist, who informed her that she had a blind abscess. He painted the external surface with iodin and later applied what the patient called a gum blister. She, however, noticed no improvement, so the dentist extracted the tooth. The swelling remained at a standstill, and so one by one she had the molars and the remaining bicuspid extracted. This gave her no relief, and the

condition became worse, evidently owing to the infection entering through the wound caused by the extraction. The dentist diagnosed her case as a chronic blind abscess with necrosis. She finally consulted a physician, who referred her to my clinic. We immediately investigated her history. She said she was married, had no children, and had aborted three times. Physical examination showed that the patient had old scars, and she admitted having had syphilis. She was very promptly placed under the anti-syphilis treatment, and the jaw thoroughly curetted. A diagnosis of syphilitic osteomyelitis with granulomata of the jaw was made. Three weeks later the patient showed splendid improvement, and was referred to her family physician for further attention.

It is not for me to describe to you the signs and symptoms of syphilis—chapters have been written and re-written. It is a subject of such vast importance that it should be as well known to the public as the school boy understands the history of our country. The writings of John W. Churchman should be indelibly imprinted in the minds of any of us who respect the health of society as a valuable asset to the community. For he says that the conditions of life in the dark ages were surely favorable to the spread of venereal contagion. Since the time of Charles the Great, no large city in France had been without its brothels; and the streets of Paris swarmed with prostitutes at night, as they had swarmed with dogs in the day. It was not uncommon for the same house to contain a school on the first and a brothel on the second floor; and as early as 1163 municipal laws had been drawn up against those afflicted with, "The perilous infirmity of burning." Add to these circumstances the prevalence of war, with its invasion of one part of the world by notoriously loose characters from another, keep in mind the opportunity for transmission afforded by the crusades, and it becomes plain that syphilis could not long remain a local pestilence.

But it was not until the beginning of the fifteenth century when syphilis broke loose with such violence, and over such a large area. In 1494 the army of Charles the Eighth, over 32,000 strong, was setting out on its wild scheme of aggrandizement with the conquest of the Italian peninsula in contempla-

tion, and a highly pious ambition to reach Jerusalem. The soldiers were French, and the French soldiers were luetic. They invaded France, and pushed their way to Naples. Charles established himself on the throne, and his army syphilized the city. Before long the whole continent was aflame. The Portuguese got the disease from Spain; the Poles from Germany; Russia from Poland; while France spread it to the Orient, and Turkey passed it on to Persia. It was not a "Mild syphilis" which poisoned this continental population. Malignant types, which nowadays are very rare, were then the regular form of disease—and the mortality was enormous.

A peculiar characteristic of syphilis is the numerous phases and various manifestations of the disease during the sometime long period of the duration. Syphilis spares no organ, and its manifestations occur in all possible parts of the body; it has, however, a predilection for certain parts, especially those that are exposed to irritation, thrombosis, and infection, for such spots as have been determined by irritation and injuring yield to the manifestations of secondary and tertiary syphilis. The mouth and its adjacent structures are especially exposed to irritation, thrombosis and infection, therefore we are able to observe in the oral cavity all stages of syphilis; it is of course well to remember that many acute and chronic infectious diseases frequently complicate lesions of the mouth. Consequently the differential diagnosis is very important and often difficult; therefore a diagnosis must not be made by considering the clinical manifestations alone, but include a thorough examination of the entire body, accompanied by bacteriological and microscopical, serological examination, and sometimes even inoculation experiments.

This could be illustrated by calling your attention to a case wherein the clinical picture was of little value in making a diagnosis. A young man, aged 21, nationality Greek, occupation teamster, complained of small nodular swelling in the region of the right mandibular third molar; upon palpation I found the mass to be painless but somewhat soft; upon inquiring into the history he admitted that he was a rounder and did not hit the high places.

Gonorrhea he had contracted so often that he was rarely without it. He knew little or nothing of syphilis, but thought

that he had had a chancre three years back. At first I came to the conclusion that he might have a gummata or even the beginning of a malignant tumor. I finally made an incision into the mass, from which oozed a characteristic yellow thin fluid. Examination under the microscope showed the case to be actinomycosis. It is advisable to search for actinomycosis in all those cases where we find a fistula which will not heal, or where we see on the lower jaw those chronic nodules, which show no tendency to progress and being painless, occasionally soften and suppurate. I have had the opportunity a number of times to find loose suppurating teeth which were directly caused by actinomycosis.

INFECTIONS OF THE MOUTH AND THEIR RELATION TO SYSTEMIC DISEASE.*

BY P. G. PUTERBAUGH, M. D., D. D. S., CHICAGO, ILL.

When asked to prepare a paper for this meeting I began to look over the various topics discussed by societies in the last few years, and to try to fit my paper to some need of the dental profession at this time. This subject in some of its phases has been given much space; and there are many phases also that have scarcely been touched at all. So I will confine my remarks to a few of the most common conditions; the ones that we are likely to meet in everyday practice.

For many years all inflammatory conditions of the mouth were considered to be purely local entities, and little if any, attention was paid to their systemic origin or to the injuries to the system that might accrue from these local lesions.

Hunter was among the first to call attention to the fact that local areas of suppuration were frequently associated with grave pathologic processes encountered in the field of internal medicine, especially the blood dyscrasias, viz., leukemia, pernicious anemia, etc. Then a little later another set of internists began to find general toxic disorders including arthritis, endocarditis, neuritis, etc., associated with small chronic foci of suppuration about the ends of roots of teeth containing dead pulps, or poorly filled root canals.

Much evidence is pouring in daily to support the claims of these investigators, and the dental profession suddenly finds it-

*Read before the South Dakota State Dental Society.

self, not a group of independent workers but a distinct and imperative link in the great chain of scientists practicing the healing art, with responsibilities hitherto undreamed of.

Those dental colleges which formerly limited their anatomy and pathology to the head and neck are awakening to their responsibilities and to the fact that much more is being expected of the graduates of to-day than was expected a few years ago; that without a thorough understanding of the structure, functions and pathology of the entire organism, their output might be compared to the house that was built upon the sands; and that we members of the dental profession must continue to be students in order to be of value to the public we wish to serve.

Inflammation may be briefly defined as the reaction of tissue to irritants. And I would emphasize the fact that it is usually more than one irritant at work when we see evidence of this condition present. By this I refer to those predisposing factors such as faulty metabolism, elimination, etc., as well as the exciting cause at the seat of inflammation itself. In oral suppuration of the mucous membranes we will, if observant, find in practically all cases, some underlying toxemia, acting in a manner which tends to lower the tissue resistance generally, throughout the entire body; as well as the local irritant, acting upon the mucosa of the oral cavity at a particular point.

The general irritants having a decided tendency to lower tissue resistance may be divided into three groups.

First—those resulting from bacterial fermentation in the intestinal tract or elsewhere.

Second—errors in metabolism, in which organs are not functioning properly and instead of their products acting in a physiological manner, they act as irritants or poisons to tissues generally.

Third—we have that large group of auto-intoxications resulting from faulty and insufficient elimination of waste products of metabolic activity.

In the absence of some one of these toxic conditions in an individual it requires a very severe local irritation to produce any appreciable effect, and such inflammation probably would be very quickly overcome without any treatment at all.

Pasteur found that fowls (which are normally immune to

anthrax) became susceptible when their body temperature was reduced with cold water. Animals such as rats, mice, etc., which have been fatigued by exercise in revolving cages are much more susceptible to staphylococcus injections than are the control animals. All of which would seem to point out that anything which disturbs the equilibrium of an organism, lowers its resistance to local influences no difference where that local area may be.

In my practice I have a patient, a physician, who has pyorrhea. We are able to get it under control nicely by local treatment, and things will seem to be doing all right until his work becomes strenuous for a period and he will be heavily taxed physically, little sleep or rest for a week or two, when the pyorrhea lights up again just a little more acutely than it had been at any previous attack. And I firmly believe that that man will lose every tooth he has, in a short time unless he will see the folly of his ways, regulate his habits, and lead a more sensible life.

The simplest form of inflammation met with in the oral mucous membrane is the so-called

CATARRHAL STOMATITIS.

The term catarrh, as you all know, means inflammation of any of the mucous membranes. Catarrhal stomatitis is an acute inflammation of the buccal mucous membrane, met occasionally in adults, but most commonly in children.

Etiology: The common primary causes are bad mouth hygiene and fermentation of food debris, sharp edges of teeth, too hot or cold foods, salivation with mercury, smoking and alcoholism. This condition is often associated with eruptive fevers; measles, scarlet fever, influenza, typhoid, and with gastro-intestinal disturbances.

Symptoms: The mouth feels hot to the examining finger, swelling and dryness are present, with salivation and general soreness; the tongue is slightly furred showing the papillae in relief as minute bright red spots. Similar spots on the buccal mucosa mark the mouths of the mucous follicles. Congestion and desquamation of epithelial cells may result in slight surface ulceration. There is a craving for cold drinks, moderate fever, intestinal disturbances, usually diarrhea; patient is restless and suffers from insomnia. The duration of an attack is about one week.

Treatment: Look to the cause and relieve that, saline catharsis in all cases, magnesium citrate solution serves the purpose admirably.

In children ice may be given to suck, and bromides are sometimes needed to induce sleep. Locally, boroglyceride solution applied with a swab, or diluted and used as a mouth wash by adults; or more preferably an iodine preparation, as the following—Tincture of Iodine 3 drachms, Liquor antisepticus, q.s. ad Three ounces. Sig. A teaspoonful to a wineglass of water as a mouth wash. Or—Alum, 10 grs. to the ounce of water has a very soothing effect, and tends to reduce the congestion.

APHTHOUS STOMATITIS.

A variety of catarrhal stomatitis occurring primarily as a vesicle and quickly passing into a round or oval ulcer with indurated margins and a white or grey surface.

Etiology: Aphthous stomatitis occurs at any age and may be predisposed by any perversion of nutrition such as gastro-intestinal disturbances, acute fevers, tuberculosis, anemias, etc. The specific bacteriology is unknown, and the condition seems to be analogous to herpes of the lips and face.

Symptoms: Ulcers, one to twenty in number, pin-head to split-pea in size, isolated or confluent, are located on the inside of the lips and cheeks and especially common at the reflection of the buccal mucosa at the base of the alveolar process of the mandible. They are extremely sensitive to touch and render mastication difficult. Mild salivation slight fever, malaise and nervous excitability manifest themselves, probably as a result of the gastro-intestinal condition which occurs coincident with the mouth inflammation. The breath is not fetid and this feature helps to differentiate it from most other ulcerative conditions met here.

Treatment: Absolute mouth cleanliness is imperative, and thorough cauterization of surface of ulcers with 95% phenol; do not neutralize as phenol will not penetrate deeply, and the full germicidal effect is needed. Apply remedies to correct the gastro-intestinal condition, usually saline catharsis followed by intestinal antiseptics such as the sulphocarbolate of zinc, or salol in 3 to 5 gr. doses, and this form of stomatitis will quickly subside. The use of acid fruits will often prevent a recurrence.

ULCERATIVE STOMATITIS.

An ulcerative condition of the gums and buccal mucous membrane with marked fetor of breath; having a tendency to make rapid and deep excoriations.

Etiology: Predisposed by unhygienic general, and mouth conditions, pyorrhea, and alcoholism, infectious diseases, and mineral poisons. Often met with as a direct result of excessive smoking, particularly of cigarettes. Occurs occasionally in children who are under nourished and where the mouth hygiene is bad; but curiously enough is never found in edentulous mouths.

Clinical Symptoms: The disease starts in one or two interproximal spaces, most frequently in the anterior part of the mouth, and spreads by continuity, following the gum margin, working its way toward the posterior teeth. In the beginning, the affected margins are red, swollen, and bleed upon slight touch. Pain is severe and constant; fetor of breath is marked and usually characteristic enough to almost enable one to make a diagnosis without further examination. The sub-maxillary lymph nodes are hard and tender to the touch. Tissue destruction sets in rapidly and in from 12 to 24 hours the gum margins are covered with a dirty white ulcer and if left without treatment the entire gum margin will usually be destroyed, down to the alveolar margin, in two or three days; and necrosis of the supporting tissues of the teeth may result in the loss of the teeth themselves. The general symptoms are impaired appetite, restlessness and insomnia, probably on account of pain with but slight if any fever. The duration of an attack of ulcerative stomatitis is usually from three to ten days, but may last for months, depending largely upon the treatment given.

Treatment: Regulate cause if possible, forbid smoking, scale the teeth of incrustations, paint ulcerating surface once daily with Iodo-glycerole (Talbot) which has the formula—

Zinc Iodid, 3 parts
Distilled water, 2 parts
Iodin Cryst., 5 parts
Glycerin, 10 parts.

First dry the surface with cotton, then apply; keep saliva away for a minute or two after applying to permit penetration. Warn patient that his condition is contagious, since epidemic outbreaks have been noted, and instruct him how to avoid infecting others. Potassium permanganate, as a mouth wash every two hours will overcome the fetid odor and should be prescribed in all cases. Iron tonics and careful feeding are necessary in debilitated children to prevent relapses of ulcerative stomatitis.

THRUSH.

A specific contagious disease occurring upon the oral mucous membrane beginning as whitish spots which later coalesce to form large ulcerative patches.

Etiology: Infancy and early youth present the majority of cases of thrush although it occasionally occurs as a complication of typhoid and cachectic states, carcinoma, etc., in adults. The exciting cause is the *Oidium Albicans* or thrush fungus. This fungus grows on either acid or alkaline media and the fermentation of milk in the neglected mouths of infants presents favorable conditions for its development, or the fungus may develop in great numbers in milk bottles that have not been properly cleaned after feeding, and may be carried from another patient by rubber nipples, or cloths used to wipe the mouth of a patient suffering with the disease.

Thrush may be expected to follow a catarrhal stomatitis in which the tissue resistance has been lowered and the mouth allowed to contain residual food material. The curd-like flakes are at first adherent to the mucous membrane and their forcible removal is attended with hemorrhage. Later they may be brushed off easily leaving a shiny smooth surface which quickly will assume the opaque appearance that it had before. The condition is not painful unless mixed infection is superimposed. The initial lesions may usually be found upon the sides of the tongue or on the inner surface of the cheeks, and appear as small flocculent patches resembling curds of milk. The mouth is dry, child is feverish and fretful, and tongue is coated. The thrush fungus may be easily detected in the flakes.

Treatment—Establish alkalinity of the saliva, and mouth cleanliness. This may be accomplished by frequent swabbing with a good product of milk of magnesia; or what is still better in the light of the work of Pickerill, is the production of a highly alkaline saliva by the administration of acid fruits or fruit juices. Say one or two teaspoonfuls of orange juice or lemonade every hour. The acidity thus produced on the immediate ingestion, lasts from 30 to 60 seconds and is followed by a strongly alkaline flow of saliva which remains alkaline for one-half to three hours.

Borax solutions are soothing and efficient, and are readily applied by winding cotton on the index finger and using that as an applicator in infants. Sugars and starchy foods should

be excluded from the diet. In children see that all milk bottles are sterilized by boiling before filling, and if doubt exists as to the purity of the milk itself, it should be Pasteurized, this being accomplished by heating to 160 degrees Fahrenheit for three to five minutes, then chilling quickly by immersing the container in ice water.

Gangrenous Stomatitis.

A rapidly spreading gangrene of the cheeks and gums occurring in the debilitated and ending fatally in the majority of cases.

Pathologically, this is an acute condition in which a considerable area of tissue is involved at once, with immediate thrombosis of the blood in the vessels affected and necrosis of the tissue thus deprived of its nutrition.

Noma occurs usually between the ages of two and five years and is more often met with in girls than in boys. It is most frequently a complication of measles, then follows scarlet fever, typhoid, smallpox, pertussis, and enteritis.

Fusiform bacilli have been isolated from many successive case examined and is believed to be the causative organism. The cultures obtained from noma, however, differ in no way from cultures of *B. fusiformis* obtained in the mouths of healthy individuals. Therefore we assume that here again we face a condition in which lowered vitality makes possible a virulent disease from an organism that is constantly present in many healthy mouths.

Symptoms—The onset is marked by a dark sloughing ulcer which starts on the inside of one cheek, with ragged outline and a fetid gangrenous odor. In two to four days this extends through the substance of the cheek to the outside and a considerable area appears necrotic. The odor becomes terribly offensive and the patient begins to show toxic symptoms such as delirium, fever, etc. Recovery is rare, 80-90% of cases result fatally.

When recovery takes place the gangrenous tissue having been removed is replaced by granulations and scar tissue which causes great disfiguration from the contractions.

Treatment—Quarantine patient until bacteriologic examination proves absence of diphtheria. If found to be diphtheretic, administer antitoxin at once. Cut away freely all necrotic

tissue and cauterize exposed edges with nitric acid under general anesthesia. Rectal feeding is usually necessary; stimulants and tonics support the patient's general condition. Potassium permanganate solutions for dressing the wound and for mouth washes are beneficial.

Oral cleanliness, local stimulation of the wound, with tincture of iodine, and supporting dietetic and systemic treatment should be continued until patient has entirely recovered. Plastic surgery will then be necessary to overcome the resultant contractures and facial deformities.

Mercurial Stomatitis.

A mercurial toxemia occasionally met with in individuals who work with mercury, such as thermometer makers, mirror silverers, chemists, etc., and now and then from one of its salts administered for therapeutic purposes.

Certain individuals have a great susceptibility to mercury and its salts, and from administration of small amounts will experience the metallic taste, sore teeth, swollen, tender gums, salivation, fetid breath, diarrhea, etc., which make the diagnosis easy.

Little treatment is necessary except the withdrawal of the drug, or occupational changes, if that is the cause. Mouth cleanliness should be insisted upon, and 5 gr. tablets of potassium chlorate, allowed to dissolve in the mouth and swallowed, every hour. Occasionally potassium iodide in 10 minim doses of the saturated solution t. i. d. will assist in eliminating the mercury from the tissues.

Leukemic Stomatitis.

I have already mentioned in the early part of my paper that patients suffering from certain anemic conditions are particularly liable to suffer from mouth ulceration, and my experience has been that they follow closely the clinical course and symptomatology of ulcerative stomatitis, except that the duration is longer and does not yield so readily to treatment. When an anemic individual presents with an ulcerative gingivitis or in any patient who does not respond readily to iodine treatment, a blood examination should be made to ascertain if the hemato-

genic organs are at fault; since it is only by an early diagnosis that leukemic patients may be benefited by systemic treatment. The treatment of the ulcers is the same as that given for ulcerative stomatitis.

Syphilis presents to the examiner such a multitude of lesions that the length of this paper prohibits entering into a discussion of this many-sided disease.

I have endeavored in the foregoing remarks to point out a few of the frequent mouth conditions that are closely allied with, and probably result from some systemic derangement or indisposition.

Then there is another group that begin as local mouth infections and produce marked systemic disturbances by the infection becoming generalized throughout the system. The chronic dento-alveolar abscess, third molar suppurations, and pyorrhea alveolaris are the principal offenders of this group, and that they frequently sow the seed for articular rheumatism, neuritis, myositis, endocarditis, probably acute thyroiditis has been proven beyond the question of a doubt.

In the chronic dento-alveolar abscesses with sinuses there is a fibrous connective tissue sac at the apex of the root with a channel or tract leading from it to the surface. This tract being lined with modified epithelium, continuous with the epithelium of the mouth, will not heal unless the sac at the apex of the root is obliterated and the entire lining of the tract destroyed. Therefore, if treatment is attempted through the tooth, first establish communication by means of water or compressed air forced through the tooth until it apptars at the surface, then follow this with a cauterant such as 95% phenol, phenolsulphonic acid, or dilute sulphuric acid until the entire lining of the sac and sinus is completely destroyed.

Neutralization is not necessary if phenol is the agent employed. Then seal within the pulp chamber a mixture of cresol and formalin (equal parts) and dismiss for one week. At the next sitting, if the sinus persists, repeat the treatment, and continue at weekly intervals until sinus closes; then, and not until then, is it safe to fill the root canals. In those abscesses of the upper anterior teeth in which this treatment does not bring about a cure after four or five weeks, an open operation

is indicated. This is performed under local anesthesia, a vertical incision being made over the apex of the affected root, and with a curet or spoon excavator the contents of the abscess cavity evacuated. If the root is found to protrude into the abscess cavity it is cut off with a plain fissure bur on a level with the floor of the excavation.

When only a small amount of the bone has been destroyed the wound may be allowed to close without further attention. (In my experience however, this can seldom be done because the simple cases yield readily to medicinal treatment and it is only the ones in which a large amount of tissue is destroyed that the operative procedures are demanded.) In those abscesses in which considerable excavation has taken place, the incision should be enlarged by cutting laterally until the external opening is as large as the interior. (This is a very important point.) After the denuded root is excised and the abscess sac curetted, pack with iodoform gauze, or with gauze impregnated with Buckley's Euroform Paste, this packing should be changed twice a week for two or more weeks, or until the interior is found to be of a uniformly pink color, indicating healthy granulation tissue, when bismuth paste may be substituted for the gauze. Bismuth may be left from one to two weeks, when it will be necessary to remove it and refill with fresh paste. If the tendency is present for the closure of the external opening before the interior is filled in, it will be necessary to again resort to the gauze packing and that will maintain free access. That bismuth in itself may become a source of irritation must not be overlooked. I have removed it after it had remained in a cavity for two years—a dirty, black, foul smelling mass, preventing tissue regeneration by its presence. Bismuth paste is very good where indicated, but to my mind it is not to be recommended in the mouth where free access may not be had for its removal.

This operation is usually not practical on upper molars, or on the lower teeth, and if medicinal treatment fails to bring about a cure in these teeth, do not hesitate to extract, as no tooth at all is much better than a pocket constantly generating pus and toxins.

A healthy digestive tract can digest food even though insufficiently masticated, without suffering a great deal in consequence; and the danger of systemic disorders from a septic process about a few teeth is much greater than of slight indigestion following their loss.

The constant swallowing of pus in pyorrhea alveolaris is quite an item in addition to the direct absorption of toxic material from the gum itself, and the most frequent systemic condition associated with pyorrhea is, chronic gastritis or gastro-enteritis, with a general sluggish condition of the bowel, diminished peristalsis, constipation, etc. And on account of the faulty elimination, a toxemia, resulting in headache, malaise, depression and a general indisposition. Many of these individuals suffering from hopeless cases of pyorrhea improve wonderfully after extraction of all affected teeth and substitution of plates therefor.

Another suppurative condition that is the cause of great concern to both the dentist and physician is that of infection about the erupting lower third molars; suppuration taking place under the gum flap covering a portion of the crown of the tooth. This extends down to the pericemental attachment at its neck. The peculiar situation of this tooth and surrounding tissues being unfavorable for natural drainage the swelling when begun, quickly blocks further drainage and the outcome is that the periosteum is stripped up along the mandible usually on its external surface, and an osteitis or osteo-myelitis results, with necrosis.

Glandular involvement takes place early, and is marked; the submaxillary and peri-tonsillar lymph nodes swelling first, and these in turn emptying into the deep cervical chain and extend down the neck.

In the acute infections, the treatment is free incision down to the bone, and the wound kept open to permit of free drainage. Daily irrigations and swabbing with tincture of iodine locally. Instruct the patient to apply hot fomentations externally for 20 to 30 minutes at two hour intervals. This is done by wringing a large bath towel out of hot water, folding it to a convenient size and applying it to the side of the face and neck, as hot as can be comfortably borne, and changed as soon as it begins to cool down. The application of heat in this manner greatly stimulates the leukocytes to activity in that region, thus combatting the infection.

The removal of the tooth is indicated as soon as the acute symptoms are controlled.

In mouth infections the toxic material drains into the lymphatics of the neck, and these in turn empty into the subclavian veins; throwing the infection directly into the blood stream. From the subclavian veins it passes on to the innominate veins and

superior vena cava to the heart. From the heart to the lung, and from the lung to the left side of the heart and into the systemic circulation. It then requires no great stretch of one's imagination to see how an endocarditis, results from these infections or how pulmonary tuberculosis would result if tubercle bacilli are present in the mouth or tonsil. Because the infection passes through the lymph vessels and into the blood stream, coming into direct contact with the lining of the heart and valves, then next in filtering through the lungs may find lodgement there.

In conclusion allow me to say, that no other part of the body offers conditions so favorable to bacterial growth, or presents to the bacteriologist so great a variety of forms as that of our chosen field of labor. Practically all forms of bacteria, both pathogenic and non-pathogenic are found in abundance, even in comparatively clean mouths. That the poisoning of the oral cavity by putrefactive conditions is not restricted to purely local symptoms is being brought to our notice more and more as laboratory means of diagnosis are improving.

And in this respect I wonder if we as dentists, are doing all that we should in this direction, because in recent years medical men are stepping in, and are studying mouth conditions as they have never been studied before, as we had not thought of studying them.

Who among you would think of an infected appendix urethra, or gall bladder as presenting only local symptoms? Then why should dentists consider these mouth infections as purely local entities?

It is my sincere desire and hope that the members of the dental and medical professions in the future will consult one another a little more frequently than they have in the past.

I believe that practically all ulcerative conditions need systemic regulation just as much as they need local treatment; and if dentists will study a little more of general medicine and physicians will study a little more of dentistry, our patients will receive better care than they possibly could without our mutual co-operation.

Bibliography: The following works were consulted in the preparation of this paper:

Practice of Medicine; Anders.

Text Book of Pathology; McFarland.

Diseases of Infancy and Childhood; Holt.

Oral Diseases and Malformations; Brown.

Mycology of the Mouth; Goadby.

REMINISCENCES OF SEVENTY YEARS' PRACTICE.

BY DR. LOOMIS P. HASKELL, CHICAGO.

[Concluded from the October DENTAL REVIEW.]

In 1864 the Chicago Dental Society was organized, and Dr. A. E. Brown and myself are the only surviving charter members. The Illinois State Society was organized the same year and we and one or two others are the only surviving charter members.

In 1881 the Chicago College of Dental Surgery was organized by three members of the Chicago Dental Society—the A. B. C.'s, Allport, Brophy and Cushing. Dr. Brophy was the dry nurse, and he led it through all its vicissitudes up to its present position, the peer of any dental college in the world, usually graduating the largest number of students, with one exception, of any college. The first faculty consisted of three members only of which I was one. Four years later I became associated with the Northwestern College for three years.

In 1889 I organized the first Postgraduate School of Prosthetic Dentistry. During the time of its existence there were students from nearly all countries.

In 1898, with a partner who instructed in crown and bridge work, we went to Europe and taught dentists in a post-graduate course in Berlin and Hamburg, advertising having been done in the German dental journals, and arrangements made for the work in dental depots. We had benches made which could be taken apart and transported to Hamburg for another class.

I had been in Berlin but a week when an invitation was extended by the oldest dental society for me to give them an address. As I could not speak German, all my talk and instructions were given through interpreters, dentists who were well versed in English.

The next week an invitation came from the largest society. At Hamburg the society there also extended an invitation. The next year we repeated in both Berlin and Hamburg, then went to Vienna and had a class. The Austrian Dental Society tendered me a banquet. At the classes we had dentists from Germany, Russia, Sweden, Hungary, Poland, Bohemia, Switzer-

land, Holland and Belgium, but all spoke German.

From here by invitation we went to Paris and held a class in the *Ecole Dentaire*. I met the French Dental Society and also the American Dental Club.

I have given informal talks before societies, largely state, in all but ten states, and am ready to respond to any call with a collection of models of abnormal, peculiar, and difficult cases upon which successful dentures have been made on metal plates.

A few words in regard to the Chicago Dental Society. Here is a membership of more than a thousand, young, middle aged, and some older men, wide awake, progressive, literary and inventive, working harmoniously each for the other. Within three years members of this society have issued some of the most up-to-date text books ever published. Dr. C. N. Johnson, two works on operative dentistry; Dr. G. V. Black, two great volumes on operative dentistry; Dr. H. J. Goslee, on crown and bridge work; Dr. C. S. Case, on orthodontia; Dr. J. P. Buckley on materia medica; Dr. F. B. Noyes on histology; Dr. Koch on history of dentistry, and soon to be followed by Dr. Truman W. Brophy on oral surgery. Dr. E. S. Talbot has published fifteen volumes along original investigations of subjects pertaining to the mouth.

May I say in closing that the student of today has not the slightest conception of his advantages over the student of sixty, even fifty years ago, in all branches of practice, and he would be utterly unable to work with the methods, appliances and materials of those days. Of course he is better fitted for practice.

PROCEEDINGS OF SOCIETIES.

CHICAGO DENTAL SOCIETY.

A meeting of the Chicago Dental Society was held September 15, 1914, the President, Dr. T. L. Grisamore, in the chair. Papers were read by Drs. Schultz and Potts.

DISCUSSION.

DR. P. G. PUTERBAUGH:

Mr. President: You have all heard the pros and cons of the question of anesthesia, and I suppose I am expected to fill in the breach and make it practical. Before I proceed, let me say that I have been very much interested in both general and local anesthesia, especially during the last few years, and these two papers represent the latest, up-to-date, concise epitome on the subject. And so I want to congratulate both the essayists on their presentation of the subject.

In recent years there has been a great change going on in the minds of people in reference to surgery. The surgeon of twenty years ago was crude compared with the surgeon of to-day in his method of handling operations painlessly. Only within the last year a lay magazine has been bringing about a great propaganda for painless childbirth, in the so-called twilight sleep of hyosin, morphin and strychnin—the H. M. S. combination, and the public is being awakened to the idea that it is no longer necessary to endure severe nervous strain in order to have dentistry performed, since recent dental advances are making this a possibility.

So far as the argument is concerned regarding inability to diagnose pulp conditions, I think they are properly diagnosed before you proceed with cavity preparation. They should be diagnosed from the gross appearance of the cavity and the history of the patient. That having been done, I see no occasion for any hesitancy in anesthetizing the patient and proceeding with the cavity preparation. So far as the necessity of pain is concerned, you would not think very much of a surgeon if he had to operate on his patient in the waking state in order that that patient might tell him when he approached a vital structure. Neither would you think much of the dentist who knew so little of his dental anatomy that he had to depend on the patient's sense of pain to tell him when he was on dangerous ground. So I don't think that argument holds

good. The main trouble with pulp exposures has been that the dentist had one eye on the anesthetic and the other on the cavity preparation, and, for a minute, both eyes on the anesthetic. No one should attempt to administer nitrous oxid analgesia alone and perform the operation.

When it comes to a choice between these two anesthetics, if an operator is obliged to work alone, without an assistant, he had better take his time, using a local anesthetic. In this way, he can give his sole attention to the operation without paying any attention to the anesthetic. But if he has a competent office assistant to give the nitrous oxid analgesia, he has something which is the nearest approach to the millenium of anything we have had yet.

Dr. Potts spoke of Dr. Crile's work on the so-called anoci-association, and I might explain a little what Crile has done—with his co-workers—on this subject. They took dogs for experimental purposes and frightened them, and found that by so frightening the dog they produced a shock to the brain, suprarenal capsule, liver and muscle. They have called these four organs—brain, liver, suprarenal gland and muscle—the kinetic system, and they have definitely proved that over-irritation of these centers will produce degenerative changes, as shown by the microscope. They also found that the same degeneration resulted whether that irritation came from strychnine poisoning, from fright, from fatigue—that is, keeping an animal awake for three or four successive days—or from surgical shock, crushing operations, etc. All these produced degenerative changes in the brain, the liver and the suprarenal gland. Then, what are we to learn from this? We are to remember that it may not be the pain caused the patient, but it is the hypersensitive patient, who walks into your office, who suffers the most, who has undergone severe nervous strain to drive himself there. We have all heard the statement that our dental chair was worse than a hard day's work, and there is no doubt about it that there are certain individuals whom nothing will quiet so well as nitrous oxid analgesia. Don't be misled by the paper into thinking that this is a dangerous thing. It is not dangerous if used for a short while. The only danger is from a deep nitrous oxid anesthesia, prolonged over fifteen minutes. There is no more danger in nitrous oxid analgesia up to the narcotic point, as used by dentists, than in walking down the street. But with the advent

of prolonged nitrous oxid anesthesia in major surgical work, the mortality has risen considerably, and it is in these cases that the danger arises. So I think Dr. Schultz's advice is good, to give the patient analgesia in short seances, and then you are practically safe, as safe as you could be anywhere.

As to local anesthesia, I used to poison patients rather frequently when I used cocain as a local anesthetic, but in the last year I have been using principally novocain solutions, as advocated by Fischer, and since then I have had no more fear of my local anesthetic poisoning the patient than so much water. I am a little careful; I do not give a big dose all at once. That might produce a great deal of absorption. I give a little at a time. That can be done with impunity.

As to the technic of anesthesia in obtunding sensitive cavities for pulp removal, there is a little plan I have used with success. Take the ordinary hypodermic needle; cut it off blunt; then sharpen that point all around, so that you have a blunt-ended needle that has been beveled all around. This will puncture the tissues easily. I have that about two or three millimeters in length, and by passing that in through the mucous membrane over the apex of the root, and slightly turning the syringe, you are able to slide that against the face of the process, and by fairly heavy pressure for one to three minutes you can force three to four drops of the anesthetic solution into the process. After removing the syringe there is only a small prick left where the needle entered. There is no soreness of the gum remaining afterwards. I am not advocating this as an everyday practice, but I prefer it because it puts a small amount of anesthetic over the apex of the root, where you need it, and you can in this way secure anesthesia for three to five minutes.

I would say this, that the successful use of any of these anesthetic agents depends largely upon the experience that you have with them. The old statement that sharp burs and careful manipulation were all that were necessary still holds true, and these anesthetic agents are only for use in well selected cases. There are other cases where the obtunding agents, the so-called desensitizing agents on the market to-day, may be sealed into cavities, and they entirely obtund pain.

This discussion to-night means this to me: For the operator who is practicing alone, without an office assistant, it would be

better for him to rely on obtunding pastes and local anesthesia. A man with a well-equipped office and a competent assistant will find nothing that will give him greater satisfaction than the use of nitrous oxid analgesia, and he, too, will find occasion to use local anesthesia at times, and he will use it in these cases, namely, those who do not dread to come to the dentist, but who yet need obtunding of pain. In such cases the operator will get along beautifully with local anesthesia. But in those patients who are nervous and dread the dental chair there is nothing that will be of more aid than nitrous oxid analgesia.

DR. E. A. SCHMUCK:

In discussing the paper on nitrous oxid and oxygen anesthesia and analgesia the history or discovery is insignificant but its uses and application from a dental standpoint are very comprehensive.

Inasmuch as the different points have all been ably covered by the essayist, to discuss them would take hours of time so I will dwell only upon the most important factors that I have observed, after a period of practical experience. This accounts for my being an enthusiastic advocate of its use.

First let us stop to consider the safety of nitrous oxid and oxygen.

Oxygen being the supporting element of life and being used in connection with nitrous oxid, supplies food for the blood, which in turn feeds the tissues while the nitrous oxid is anesthetizing the patient.

So in dental uses eliminating fright or shock and physical causes such as the lodging of a tooth in the trachea (which by the way, are incidental and controllable causes only) one cannot conceive of death occurring as the result of administering the nitrous oxid and oxygen combination. It has also been proven that nitrous oxid and oxygen have no effect on the liver and kidneys nor do they destroy the functional activity of the leucocytes which resist the toxemia of infection, so we are inclined to agree that it should be the anesthetic of choice in the dental profession.

As the curricula of the various dental colleges do not include instruction relative to nitrous oxid and oxygen anesthesia and analgesia, it is necessary for one to take advantage of a course of lectures before beginning its use; these absorbed and applied to a few weeks of practical experience will enable you to cope with

most cases and continued use in your office will cause you to become an enthusiastic advocate of its application to dentistry.

The next thing to consider is the proper apparatus, which should consist of the larger cylinders of the gases as they are the most economical, and should be attached to reducing tanks which allow for the expansion and warming of the gases to room temperature. These prevent freezing of the valves at the cylinder head, thus the gases used come from the stored up supply in the expansion tanks, which in turn are fitted with gauges that control the pressure wanted. Connected to the tubing leading from the reducing tanks is the apparatus which is portable and has two bags. These bags supply the gases to the inhaler as they are called for. The bags should be fitted with automatic regulators. (these will be on the market shortly) as they automatically control the pressure of the gases which enter the bags, not by troublesome and unreliable diaphragm gauges but by plunger arms encircling the bag that automatically close the valves as the bags expand or open them as the bags are emptied into the mixing chamber.

The adjustment of these arms is controlled by a dial that will permit any desired pressure or flow of gas.

From the bags the gases enter the mixing chamber which contains a device similar to a fan that mechanically disturbs the gases and mixes them to the desired proportions. From the mixing chamber the gases pass through a flexible tube to the inhaler best suited to the case presented.

By the way, nearly all the gas machines on the market have their individual merits and the numerous failures do not always reflect to the machines themselves but to the operator who may be inexperienced and possibly has not prepared himself to administer nitrous oxid and oxygen properly.

The third point under discussion brought out by the essayist, that all bearable or painful dental operations should be rendered painless by the anesthesia or analgesia route, is one that no dentist with the right brand of human sympathy or who wishes to give conscientious service to his patients can overlook or stop to seriously consider.

Who among you do not see almost daily the nervous, frightened patient who presents himself with several cervical cavities so sensitive that they can scarcely be touched with a wisp of

cotton, or the lady who with a very high strung so-called "temperament" just dreads dental work of any kind.

These people desire your services and demand for the fee you are to receive skillful and lasting restorations. Can you do it as it should be done and not go home exhausted and wish these nervous cases would go to some other fellow?

With analgesia you may overcome and control those cases. You can prepare your cavities property, and the patient, by means of suggestion, forgets his fear. The pain is controlled and consequently they have no dread of the next sitting when you may set and polish your inlays, etc., in the proper manner.

Briefly, let us consider the action of nitrous oxid and oxygen: In analgesia it has the function of numbing the nerve centers of the brain, which govern our sense of pain caused by mechanical irritation of the nerve endings. This function is controlled by the gateway established by the proper percentage of oxygen.

Idiosyncrasies sometimes make it necessary to vary the percentage of oxygen; some may not require over eight or ten per cent, others as high as twenty or twenty-five. I find it best to start at a low pressure of the nitrous oxid, gradually increasing it together with the proper percentage of oxygen until the so-called "gate" is established, and then the regulators will automatically hold your gate open and together with suggestion and advice as to the proper breathing through the nose you can begin to operate and will have to pay very little attention to your apparatus.

To go into the administration of nitrous oxid and oxygen, and details regarding it, would no doubt be interesting to some of you, but time will not permit, and as one should have instruction before attempting to give analgesia intelligently, it would be of little use to burden you with a description of that sort.

The time-saving advantage of analgesia that often presents itself, is when you have reserved an hour for the patient who unexpectedly presents a very sensitive cavity and in preparing same to get your impression you find that you will have to seal in a desensitizing agent. Then after waiting twenty-four or forty-eight hours you can go on with your work, but consequently have lost half the hour's time allotted to this patient.

With analgesia proceed at once, finish your work—and the "time is saved."

On two different occasions under analgesia I have been able to painlessly remove pulps of anterior teeth. Also often expose the pulps in bicuspid and molars with a bur, for arsenical devitalization, simply by suggesting two or three deep inhalations through the nose and by increasing the pressure slightly through the regulators. This produces a deeper analgesia, but as a rule is contra-indicated, as fluctuation sometimes causes nausea.

Shock caused by dread and fear, I find, can be controlled by positive suggestion.

Possibly I have drifted somewhat from the points under discussion in the essayist's paper. If I have, I beg your indulgence and hope you will consider nitrous oxid and oxygen analgesia and anesthesia seriously and then go to your offices and have a stimulus for better and more humanitarian dentistry.

DR. C. H. ELDRED:

Mr. President: Dr. Potts has presented this subject to you in such a precise, boiled-down manner that he has left very little to discuss. I say boiled-down for, from my point of view, the subject cannot be presented to you so that you would get all of the points and information you are looking for unless the essayist had used lantern slides or many diagrams, but he has given you the points of injection and manner of doing so in the best manner in which it could be done without the aid of the lantern. Slides for this subject would be very hard to get. You can realize this, if you will buy the work, "Local Anesthesia in Dentistry," by Professor Guido Fischer. It is a book of 235 pages, with 115 engravings, and from this you will see Dr. Potts has boiled down his subject. Get Dr. Fischer's book and study it, and you will then see why the technic in conductive and infiltration anesthesia is so important.

I want to enlarge upon one point in Dr. Potts' paper, and that is asepsis in reference to the care of the syringe, preparation of solution and preparation of field of injection. How many of you, when you want to use a hypodermic syringe, have found it not in working order? Many, no doubt. To avoid this, keep your syringe suspended in a covered jar containing two parts of absolute alcohol and one part of chemically pure glycerine. This solution remains sterile, and does not attack the metal of the syringe. Before and after use, hot distilled water is drawn into and

discharged from the syringe several times. All traces of alcohol should be washed out, for if not removed it would produce anesthesia lasting several days. The hot water also heats the syringe and prevents the anesthetic solution from cooling below the blood temperature. This solution will keep the syringe bright and slightly lubricated, and ready for use at all times.

The anesthetic solution I use I make from Hermann Prinz tablets dissolved in 2 c.c. sterilized water, by boiling. The solution for injection should be as near the temperature of the tissues as possible. Injection of very hot or cold solutions produces serious tissue lesions, usually followed by extremely painful infiltration.

The field of injection must be sterilized before inserting the needle. I use tincture of iodine and tincture of aconite in equal parts, which hardens the tissue and fixes the bacteria, so that it cannot get into the wound. Iodine and aconite also relieve the slight pain of the insertion of the needle. Secret preparations should not be used, as they are not stable unless they contain strong preservatives, which are highly irritating to the tissues. Also, if anything happens to the patient, you are in bad legally, if such secret preparations are used.

Extreme care in the preparation of cavities should be used, for injection of novocaine and suprarenin produces anemia of the pulp.

In my work, using this method of anesthesia, I have amputated roots of central incisors, lateral incisors, palatal roots of upper first molars, removed pulps, and prepared sensitive cavities in all teeth. However, I would advise against immediate root filling.

DR. J. E. NYMAN:

Certain things have been said tonight about the toxicity of the anesthetic solutions used in producing local anesthesia. There are two forms of toxemia apart from that of septic toxemia developing from the use of novocaine-supra-renin solutions, one of which is a systemic toxemia, which occurs almost immediately or shortly after the administration of the local anesthetic, and the other (and it may, perhaps, at times be the graver toxemia of the two) is the purely local tissue toxemia, which is not manifested for twenty-four, thirty-six, forty-eight and sometimes sev-

enty-two hours after the injection. This toxemia is not at all a septic toxemia, but one due to the fact that there has been a chemical degeneration of the more unstable of the two drugs used in the solution, namely, the suprenin or adrenalin. Sup-rarenin bitartarie as it should be technically termed should be used, because it is more uniform and more stable, but that would undergo the typical adrenalin degeneration if brought in contact with any of the alkalis, and frequently our hypodermic syringes are boiled in solutions containing carbonate of soda. It will deteriorate sometimes because of the mere trace of alkali in distilled water; absorbed from the glass of certain bottles in which it is kept; because of the combination of heat and humidity oftentimes, or because of exposure to light.

This secondary toxemia is more or less of a gangrenous type, and may prove to be very serious. Sometimes it resembles some of the old gangrenous degenerations that we saw from injections of chloral hydrate, before that was finally abandoned. It is absolutely essential, I believe, that we use freshly distilled water, that shows no signs of any flocculent granulations in any place, and this water should at once be made into an isotonic solution, and put in a receptacle of glass which contains no alkali whatever. That solution should be made sterile by boiling for a period of anywhere from ten to twelve minutes, if necessary. I make the isotonic solution with the Ringer Beta tablets. This is the way usually that isotonic solutions are made by surgeons throughout the world.

I have in mind two cases in which colleagues have called me, I suppose because I was rather closely associated with Professor Fischer when he was here and made his marvelous demonstrations. These colleagues called me because of this secondary toxemia, of which I have spoken. They said they were very careful about having freshly distilled water, painting the parts with iodine, and observed all the other details of technic, and so could not account for the development of this condition. I asked them to let me see the tablets used, and I found that they had turned a slight yellow. On questioning these men I found that these anesthetic tablets had been exposed for some time to heat, light, air and whatever humidity happened to be present, and then had been put in a white glass bottle. These tablets should be kept as nearly hermetically sealed as possible. One should never use a solution that is not

absolutely colorless. The anesthetic solutions should be made not more than a half hour before you wish to use them. In a proper receptacle the solution may be kept for a week. You may determine by inspection from time to time as to whether any degeneration has set in or not, because if it has you will notice little floccular masses, and if these are present the solution should be thrown away.

Instead of the so-called Perfection syringe I have used the one manufactured by Frerenstein, of Berlin, an iridio-platinum needle. With this needle there is absolutely no danger of accidental breaking.

As regards the relative merits of analgesia with nitrous oxid and oxygen and that of local anesthesia with suprarenin and novocain, my preference is decidedly for the latter, not only from my experience as an operator, but also as a patient under both methods. My own personal experience has been that I have been in a far more disagreeable attitude of mind and body under nitrous oxid and oxygen analgesia, although given by men of noted reputation as anesthetists in those drugs, than under the conductive anesthesia of suprarenin and novocain. Furthermore, once you have mastered the points of injection and the various methods of technic, once this careful aseptic method has become a habit with you, there is nothing the patient can do to defeat the successful establishment of anesthesia, while that is not true of nitrous oxid and oxygen analgesia in which you constantly have to have the co-operation of the patient, who may be of a nervous, hysterical temperament, so that at the moment when you most need assistance it is not there. If you carry them to the point of being completely under the anesthetic, you are apt to have an anesthetic agitans develop, or an excessive flow of saliva, with increased viscosity, and the whole region made more difficult of operation.

My views are the same as those put forth by Dr. Gregg, of Pittsburg who for years was noted as one of the foremost analgesic experts in the country. After Fischer's visit to Pittsburg Gregg said that he had used regional anesthesia about a hundred times, and nitrous oxid and oxygen but three times. There is a man who could only be convinced by the most overwhelming evidence that conductive anesthesia was superior to nitrous oxid and oxygen anesthesia.

I have heard the same thing from patients who have had both

methods employed. I recall the case of one young man, especially, who came showing a mouth with fourteen open cavities and four pulp extractions necessary. This young man had repeatedly had nitrous oxid and oxygen analgesia used, and he said he preferred to let the teeth go. He admitted his mouth was in a frightful state because he could not control himself—neither could any operator. It so happened that a young man about his own age, for whom I had used conductive anesthesia three times, was in my office at the time, and through him we persuaded this young man to let me try conductive anesthesia. This young man—nervous, apprehensive—would have defeated any attempt at nitrous oxid and oxygen anesthesia. The anesthesia would have had to be profound, and it is not well to have a patient in that condition while performing delicate operations on the teeth. Furthermore, nitrous oxid and oxygen analgesia renders the field of the incisors a very difficult one for operation, on account of the obstruction of the inhaler. So it has been my observation and experience—as I say, both from the standpoint of a patient and operator—that regional anesthesia, conductive anesthesia, is far more certain, definite and satisfactory to operate under, but you must observe the very strictest precautions in the preparation of the solution, both in regard to the water, the tablets and the needle and syringe and the mucous surfaces. Those things are all absolutely essential.

The doctor was not quite right when he said that it was the validol that proved of service in these cases of collapse. That of itself is of very little service. I think that most of the cases of collapse are due to the suprarenin rather than the novocain. It is the addition of the camphor—seven drops of validol camphoratum in a half ounce water—that has the good effect. It is one of the statutes of the German Empire that no one may use a local anesthetic containing either cocain, novocain, suprarenalin, or anything of that nature, without having an oil of camphor solution present to use as an antidote in case of collapse.

Conductive anesthesia in dentistry is one of the historical advances that have been made.

DR. E. S. BARBER:

I have been using nitrous oxid and oxygen analgesia and anesthesia for five years. I think this society—which is the largest of the kind in any large city—and I say this after having ad-

dressed thirteen thousand dentists in North America—has started in the right direction, but you have only made a start. It would not be possible to thoroughly describe nitrous oxid and oxygen administration in less than twenty hours of rapid talking. Dr. Schultz has simply given a little history of the subject, and given a little start. I hope this society will go on, as societies in other cities have done. There is no question but that both methods outlined tonight are useful. Some cases call for one method, and others for the other, and the combination is fine.

There is an easier way to determine how analgesia should be given properly. The best method is by the use of a tape line. We have tried to weigh anesthetics, but have been unable to do so. By putting a tape line around each bag and filling them to where the tape line registers nineteen inches in circumference, you have the point of light analgesia. By increasing it to twenty-four inches you have a rather heavy analgesia; thirty-four inches is the largest amount necessary for analgesia, and the amount necessary for average anesthesia. Thirty-six inches is heavy anesthesia; forty inches is all the bag will bear.

Talking of pressure, the average analgesia requires a pressure of one sixty-fourth of an ounce. The human lung can only stand four ounces. Either by using a water gauge to keep the pressure low or using the tape line you have analgesia as it should be given. Most men speak of a bag being three-quarters full or full. Half-full bags vary, and that would be too much in the average case. The nineteen-inch bag is so small that the average observer would say there was nothing in it, because the bag spread out flat only measures sixteen inches.

I hope this society will go on and study this proposition. It will require just as much study as the cast inlay ever did, or cavity preparation. The reason men have failed with nitrous oxid and oxygen administration is because they have only read that it is a good thing, and never read how to perform it.

DR. J. P. BUCKLEY:

I am saying nothing derogatory of these most excellent papers and discussions, since the discussion has drifted largely into the painless preparation of cavities in vital teeth when I say that the papers and discussions tonight are related to the things that were, and not to the things that are. By that I mean this: In the early

history of civilization we find that men possessed to a marked degree the spirit of the cardinal virtue of fortitude, by means of which they were able to undergo the necessary pain, peril or danger incident to life. The discovery of anesthesia and the humanitarian tendencies of years have so changed human nature that we find few people today who manifest this spirit as did the people of old, to any marked degree. This condition of affairs has demanded more painless methods of practicing dentistry, and the one operation that has caused more dread of the dental chair, the one operation that has wrecked more dentists' lives than all others combined, is that of working upon hypersensitive patients, whose teeth were hypersensitive. Ever since the art of filling teeth was first begun, both the dentist and the laity have dreaded the pain inflicted, and have treasured the ardent hope that some day cavities could be prepared in vital teeth without pain. Any method or means which places a tooth or patient in such a condition that the dentin can be drilled to any depth without pain is a dangerous one to place in the hands of the profession in general. I make that statement without any qualification. Pain is Nature's indicator, and pain should be our guide. There is one ideal way of desensitizing dentin. There is one safe way, and that way is to apply a remedy to the cavity of the tooth that will affect the dentin only to a given depth, and not reach and affect the pulp. That is the ideal way, the ideal method of handling these patients, and when that day comes the dread of the dental chair, the severe mental strain upon dentists, the fears of procedures upon vital teeth, the ruthless destruction of the dental pulp with its frequent evil sequelæ will have been abolished.

I have known for some time that formaldehyde would desensitize dentin. The problem that I have been trying to solve has not been to obtund sensitive dentin. This can be accomplished in many ways, but to obtund hypersensitive dentin to a given depth so that the pulp of the tooth will not be affected has been the problem. Formaldehyde is an irritating agent; it is hard to handle. Some are so afraid of it that they would not even seal it in the canal of a putrescent tooth. How to harness up this gas and make it do its work has been somewhat of a problem. We had to modify the irritating effect of formaldehyde. Novocain was too slow in its action. Those who use novocain have admitted tonight that

they have to wait eight or ten minutes after injection in order to have the anesthesia produced. I had to have a remedy that would act upon the sensitive fibrils as soon as it was applied. Cocain will do that much more readily than novocain, and yet cocain, rapid as it is, is a little slow. A new local anesthetic has been developed recently. You have not heard anything about it, to any appreciable extent at least, because experiments now are being conducted with it. It is an anesthetic called neoesin, and is supposed, according to the experiments thus far, to be equal in anesthetizing power and twice as rapid as cocain. I can take neoesin, combine it with trioxmethylen, which is solid formaldehyde, add to it a little thymol, for its disinfectant part, and I have a remedy that is absolutely certain and absolutely safe. The proportion of these three ingredients is 11 parts of neoesin, 12 of thymol, and 77 of trioxmethylen. I take those three drugs and combine them with a peptolatum base, coloring with some insoluble material to tell it from the tissue structures, and one grain of that combination is enough for about fifteen to twenty applications. Reasoning on the basis of fifteen applications to one grain of the combination, we have in that one application 1-300 of a grain of neoesin, 1-270 grain of thymol, and 1-43 grain of trioxmethylen. You can take the most sensitive cavities, that you have dreaded to see come in—gingival cavities—seal that remedy in for twenty-four or forty-eight hours, and you can absolutely drill to your heart's content, providing, of course, you don't drill too far. You can't go to the pulp and expose it, and I am glad of it. This remedy, fortunately, is automatic and practically fool-proof, in that if you place it in the tooth where contra-indicated it will make it ache. That is one of the best things about it, because that is a check on the careless operator who would use it in those cases where the pulp, because of its pathology, should be removed.

I hesitated just a little to make these public statements at this time, for the reason that on the twelfth of October I have accepted an invitation to read a paper for the first time on this subject before the Second District Dental Society of New York, and inasmuch as that invitation had been accepted some months ago, I would have preferred to have made the formula public at that time, were it not for the fact that these discussions tonight, as I said in the beginning, have told us well of the things that were

and not of the things that are, so far as the methods and means of preparing cavities painlessly in teeth are concerned.

DR. L. L. FUNK:

I think it would be a misfortune to let this meeting pass without mentioning pressure anesthesia. After listening to the papers and the discussions, and summing up the whole matter, I believe that pressure anesthesia for operating upon the teeth is the best method yet in existence.

DR. BROWN:

There is one little thing that has been overlooked. It is the man behind the gun. That is, the idea of conveying to the patient's mind your own mental attitude toward the condition of that tooth and the result of drilling on it. In other words, suggestion. Suggest to the patient that the work is going to go forward without inconveniencing the patient's feeling. I find that it is as good as ninety per cent of the drugs on the market today for obtunding sensitive dentin.

DR. SCHULTZ (closing the discussion on his part):

I am very sorry that the discussion has taken the turn that it has. I made no attempt at comparison between the different method of eliminating pain from the dental office, nor did I claim preference for one method over another. I stated clearly in my paper that there are cases in which local anesthesia is the method to be used; also cases in which therapeutic measures are the best, and still other cases in which suggestion is sufficient. The old-tried method of using sharp burs combined with great care in manipulation and sincere sympathy with the patient is just as efficient today as it has been in the years gone by. We all know that. My paper does not take up the question of comparing one method with another except, I may say, to show that the method that I have brought before you tonight is the method of choice in a certain, well selected number of cases and that number is not a small one either. I use it, and use it quite extensively in my practice.

I am very glad that my friend, Dr. Buckley, has found something automatic and fool-proof. This method is not. To use this method it is necessary first of all that the operator possess the necessary experience and knowledge of technic, second, sound judgment in the selection of cases where it is indicated and third, he

must make a correct diagnosis of the condition of the pulp before the operation.

I am sorry Dr. Puterbaugh made the statement that it is innocuous, and that you can use it safely in all cases. I would not want you to go home with that impression. I do not think it is right. There are cases in which you can do a great deal of mischief with it. I am not speaking of anesthesia only, but am including analgesia. A few examples will illustrate my position. For instance, in very young children it should not be used like water. In people with very marked vascular changes, as mentioned in the paper, such as arteriosclerosis or atheroma or any of those changes, one should be very careful. In people with very high blood pressure I would be slow in administering nitrous oxid and oxygen. The same thing is true in people having recently suffered from apoplexy. I do not wish you to take that thought with you, that it can be used in all patients. It is not to be used in that way, but should be used with a great deal of judgment, not only so far as its administration is concerned, but more especially with reference to the selection of the patient. In my opinion, a few lectures to those inexperienced in its use are by no means sufficient to fit an operator for that sort of work. It is not innocuous enough. It is not without danger to that extent, and yet I am free to say, that I admire the temerity of those operators who are willing to use this method, under present conditions, when so far as I know, opportunity does not exist to get sufficient didactic and practical training to properly fit the inexperienced. I hope, however, that such opportunity will be made available in the near future to everybody who wishes to take advantage of it.

So far as the use of regulating valves on the apparatus is concerned, I believe that they are very good. The use of such valves would make the constant regulation of the flow of the gases unnecessary, but would by no means make the apparatus nor the method automatic or fool-proof. The volume of each of the two gases has to be regulated in each case and may have to be changed during the administration to meet arising conditions.

I am sorry that Dr. Nyman feels as he does with reference to this method. I cannot imagine why he did not like the nitrous oxid analgesia, but with all due respect to him, what he says does not conflict with my statement, for I have not claimed all cases for

this method, but have said that there are cases in which it is indicated as well as some in which it is contra-indicated. There are cases in which local anesthesia is the method that should be used and nothing else. And, I have no doubt, there are cases in which Dr. Buckley's paste is going to be all right.

I, for one, am glad that we need insist no longer that our patients exhibit those cardinal symptoms and signs of fortitude, when they come to our office, but that we can adapt our treatment to the condition in which we find them. We all meet with many cases in which the elimination of pain is indicated and in such cases the operator generally has the choice of the nitrous oxid and oxygen method or local anesthesia. Then, there are those cases in which a local anesthetic would not take away the anticipation and fear, and in those cases, when the fear produces shock sufficient to indicate the use of the method I have described, it should be used and that is the principal indication for its use, namely, the abolition of that fear and anticipation.

DR. PORTS (closing the discussion) :

Mention has been made tonight of the millenium, and it seems as though the millenium will have been reached when some substance or method becomes a panacea. That will never be. There are many different cases, many different patients suffering from many different diseases and different degrees of the same disease, we might say. The man who is best equipped to handle and serve those patients is one who is of mature judgment, is familiar with the drugs or means which he has at hand, and has the ability to use them. Consequently, if one would use any drug or any method, let him be prepared from every standpoint. Then only will his patients have the best service that he can give them.

THE DENTAL REVIEW.

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EDITOR: C. N. JOHNSON, M. A., L. D. S., D. D. S.

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EDITORIAL.

THE PENDULUM.

In May, 1913, we published an editorial in this journal entitled "Look Out for the Pendulum," in which we cautioned the profession not to stampede in the direction of promiscuous tooth extraction. We feared at that time that the very proper warning against the injudicious retention of diseased teeth in the mouth on account of the danger of systemic infection would lead many practitioners to go to the extreme of a needless and indiscriminate extraction of teeth which by proper treatment might be made healthy and useful. It is so hard to hold the profession down to a legitimate basis in the practice of any new theory, and when certain members of the medical profession came before dental societies and proclaimed the disastrous effects which might readily follow the retention of diseased teeth the dangers of the situation became so magnified in the minds of the dentists that it was quite evident that there was likelihood of many serviceable teeth being sacrificed. It was with the idea of stemming the tide and causing dentists to think carefully over the question that the editorial was written. The thing we feared has apparently come to pass, at least in certain quarters, and we reproduce here an extract from the London Letter of the *Medical Record* of September 5, 1914, to show the impression that has been made on the profession of England and particularly on some of the people there. The letter reads:

"Oral sepsis, its dangers and radical treatment by extraction of teeth has for a long time been a subject of discussion among practitioners of all branches of the profession, particularly in the dental specialty. It has long been recognized that the sacrifice of a tooth or two will suffice in many cases to cure a restricted pyorrhea which, if neglected,

would be likely to spread and which had indeed resisted other treatment. This being so, the tendency is to refer these cases to the dentist who naturally resorts to the measure which has proved so effectual. It is here that the question arises as to the limit of the operation and one would imagine that should be determined by the extent of the disease in each case. With increased knowledge of the progressive nature of the lesion and improved appliances, fear of ill consequences following operations has diminished until what has been termed "wholesale" extraction has been practised by a number of dentists and has been sanctioned by others as legitimate surgery. This extreme is the extraction of the whole of the teeth for a case of extensive chronic pyorrhea as a cure of the condition and a safeguard against the oral sepsis involved becoming general septic poisoning, apart from which we are assured that many invalids recover their health soon after exchanging their natural for an artificial denture. Here we generally consider that American dentists are ahead of ours so I will not discuss the matter fully but report our recent proceedings.

At the end of July a protest against "wholesale" extraction appeared in the *Lancet* from the pen of Sir James Goodhart. This elicited replies from some of those dental surgeons who have advocated the method and will not admit his assertion that "a harmful practice has come into vogue that needs to be held up." On the other hand one meets those who acknowledge that extremes are dangerous and perhaps some have gone too far. It is pretty certain that many people have retained a number of serviceable teeth after having been recommended to part with them all. On the other hand it is frequently urged that formerly it was too common for decaying teeth to be left when they were obviously injurious as sources of oral sepsis.

Free discussion of such questions between practitioners can only do good. It is otherwise when the differences of opinion spread to the public—or rather to that section which deems itself competent to judge them by its own intuition. That this question has found its way to such critics was forcibly impressed on me a few days ago when a healthy woman of 27 with an almost complete set of sound teeth—the envy of her friends—asked me if I approved of the new dentistry, that is she explained getting rid of all the teeth as soon as one or two decay. Surprised, I exclaimed surely you do not think of parting with yours, to which the response was "No, but it has been suggested." By questioning closely I elicited that it was not a dentist but "only friends who knew all about the plan," which they assured her was a preventive of worse things. "If one became diseased others might follow." To which I responded that if one finger or toe became diseased the same might be said of its fellows, but was met by the retort that a toe was more important than a tooth, so I limited the comparison to a nail and told the lady that surgeons are sometimes obliged to evulse the great toe nail but they do not extend their operations to the other toes of the foot. I added something about the monstrous absurdity of non-professionals assuming to decide such questions."

It is encouraging to note that certain members of the medical profession are awakening to the evils of indiscriminate extraction, and eventually we hope to see this question of practice placed upon a rational basis. We reiterate what we before stated, that no diseased tooth which cannot be made healthy should be permitted to remain in the mouth, but conversely no tooth should be condemned to the forceps on the mere assumption that it is at fault when there

is no real evidence to prove that it is so. Careless and offhand diagnosis is to be deplored in either case, and in justice to the patient there should be a closer consultation between the physician and the dentist, with the end in view of clearing up all doubtful cases and placing our practice on a safer basis.

POSTGRADUATE STUDY.

One of the most encouraging signs of the times in dentistry is the increasing interest in postgraduate study. Men are coming more and more to realize that after being out of college a few years they are in need of a course of study to make themselves familiar with the most recent developments in the science of the profession. As a matter of fact the average student in college before graduation has little conception of the really significant needs in dental practice. It is only after a few years of actual experience in an office that a man realizes just what he wants in the way of study, and it is this which makes so many of our practitioners anxious to do postgraduate work. A notable example of a successful practitioner's course was one recently completed at the Royal College of Dental Surgeons of Toronto, where Dr. W. E. Cummer conducted a class in dental prosthetics from August 29 to September 12. This is the first postgraduate course in Canada confined strictly to prosthetic dentistry, and reference is made to it at this time to show the interest in this work, as evidenced by the number and character of the men in attendance. There were twenty-four in the class, and they came from as far east as Providence, R. I., and as far west as Moosejaw, Sask. There were men from Buffalo, N. Y., Hartford, Conn., Montreal, Ottawa, and many other places, and they were all men of a high order of proficiency. This is an indication of the interest in postgraduate work, and the encouraging thing is that it is bringing out the best men in the profession. The rapid evolution of dental thought and practice makes it imperative for men who are progressive to constantly keep reviewing their work and there is no way in which this can so perfectly be done as by postgraduate courses. We congratulate Dr. Cummer on the success of this class, and we also compliment the members on this evidence of their determination to be in the foremost ranks of professional progress.

THE EDITOR'S DESK.

ABROAD IN WAR TIMES.

ANOTHER VACATION STORY.

(Continued from the October Number.)

ARRIVAL IN FRANCE.

We sailed from New York July 18, and reached Cherbourg, France, July 24. We were taken off in a lighter—the Imperator not being able to get to the dock. As the lighter and the big ship met, the band on the latter played the Marseillaise as a tribute to the French. What a change was to come over those two nations in one short week!

I shall never forget the scramble from the Imperator to the lighter, and from the lighter to the train which was waiting to take us to Paris. But for a friend who came from Paris to Cherbourg to meet us we should have been sadly confused. As it was we got safely and comfortably on the train and had a very delightful ride through a beautiful country to Paris. Distances in Europe are seldom told in miles but in hours. From Cherbourg to Paris it is six or seven hours according to the train you take.

We feasted our eyes on a strange land and I shall never forget my first impressions of France. As every one knows it is a perfectly cultivated country—not a foot of ground being permitted to go to waste. The farms are divided into minute fields, and a side hill in the distance looks like a crazy quilt with its odd patterns and variegated colors. If France reminds me of any country it is of the better cultivated parts of Ontario. It is rolling like Ontario and the soil I imagine is much the same. But there is one vast difference. In Ontario and America many of the farm houses are frame and all the barns and sheds are of the same material. In France I did not see one wooden building. They are all of stone, brick, or cement, and the roofs invariably of slate or tile. Of course the barns are not so large as are those of America because of the small acreage of the farms. The barn yards are walled in with stone or cement and there is a sense of solidity about the

groups of buildings which could never be obtained with wood. There is also an age and a mellowness which is wonderfully attractive, with plenty of moss in the cracks and crannies of the walls and roofs. I like the softening influence of moss—it speaks of old associations and the toning tendencies of the years.

The peasant classes of France are industrious, frugal, and happy. They are entirely a different type from the Parisian—the contrast being probably greater than it is between the farmer and the city man of America. We of course saw women working in the fields and it did not look so very terrible as I supposed it would. I had heard much about the practice of having the women work in the fields in Europe, and I was quite prepared to be shocked, but they seemed so happy and healthy that I was entirely disarmed. I saw none of them lifting heavy loads or doing real drudgery, and I imagine that it is not altogether a bad thing to have the women out in the fields a certain part of the day. I had no opportunity to observe the home life of these people, and am wholly unable to pass an opinion on their sociological status. But I would greatly like to motor through France and mingle with the people of the country. Which reminds me that the roads of France are by far the best I have ever seen anywhere and it must be a joy to drive over them. Some day I hope to learn the French language and go over there and get really acquainted with the French people.

One thing that struck me in going through the country was the splendid condition of the live stock on the farms. The cattle and horses looked sleek, fat and well cared for. The French farmers have evidently learned the lesson that the cheapest way to keep stock is to keep it in the best condition. It takes much less to feed a cow or a horse which is fat and healthy than one which is thin, and if this lesson were well learned by the average farmer it would save the country millions of dollars. Incidentally it would be much more comfortable for the cattle.

PARIS.

What shall I say of Paris? I had read and heard so much of Paris that I approached it with peculiar sensations. I had heard of its beauty—its marvelous beauty. I had heard of its art, of its traditions, of its historical atmosphere, of its architectural attractiveness both as regards its buildings and the landscape scheme of

the city. I had heard of its old Latin quarter with its narrow streets and quaint structures. I had heard of its public buildings, and the superb paintings covering their walls. I had heard of its statuary—its statuary every where, inside the buildings and outside in the open. I had heard of its monuments and its arches, of its trees and its parks, of its wonderful boulevards and squares. I had heard of its theatres and cafes—where tables are set out on the side-walk with people eating and drinking. I had heard of its cathedrals and its museums, of its river Seine with her famous bridges, and even of the morgue devoted to the reception of bodies taken from the river. And I had heard other things of Paris—things not so pleasant or attractive as her art and her beauty. I had heard of her vice, of her immorality, of her blatant disregard of the decent, the pure and the refined. I had heard of her tawdry display of the base and the sensual; of her utter disregard of all the decencies of a virtuous and domestic life. And I was prepared to hate and despise Paris for this, as I was prepared to worship at the shrine of her art, her literature, and her marvelous beauty.

My impressions of Paris as seen at first hand are entitled to little consideration owing to the brief span of my sojourn in her midst, and I give them with all due reservation. But they are at least given without prejudice and with an earnest desire to paint the picture as I saw it. Paris in her morals is vile if you look for vileness, but so is every other large city. The propinquity of people seems to bring out the baser elements. The only difference between Paris and other cities in this regard is that it is easier to encounter such things in Paris than in most cities. She is more open, more matter of fact, and takes more for granted with respect to immorality than most cities. Herein lies her great danger. Any city, or nation, or individual whose sensibilities are dulled to the decencies of what we call civilization is on the direct road to degeneracy. And yet I must say this one word for Paris—that in going there one does not necessarily encounter vice and vulgarity. But for that matter this can also be said of most cities and I am often impressed with the fact that those individuals who visit large cities and go away with lurid tales of what they saw are simply advertising the fact that they deliberately searched out these things as the jackdaws who love to peck, or the prude who loves to be shocked with the salacious. The distinction between Paris and

other places is this that in Paris an effort must be made to avoid such things, while in other places an effort must be made to discover them. For instance in Paris you must stay away from certain well known theatres if you wish to avoid seeing girls brought upon the stage almost naked—in other cities you must have inside information to enable you to find such places. The people of Paris are not so easily shocked as are other people. They are so accustomed to high art upon their canvases that they see little impropriety in high art in real life.

But if one goes to Paris with the desire to see the beautiful



Place de la Concorde.

and legitimate,' and to avoid the vulgar and sensuous one can do it. And the experience is worth many times a trip across the Atlantic.

I cannot here describe all the points of interest in Paris and must content myself with merely a meager reference to a few of them. First the city is wonderfully laid out—with beautiful boulevards radiating from certain centers or squares called "Places," such as the "Place de la Concorde," the "Place Vendome," etc. Please do not imagine in your wildest dreams that these names are pronounced anything like they are spelled. Place Vendome

for instance is called "Ploss Vondome." The Tuileries gardens designed in 1665 are called the "Tweelree." The Avenue of the Champs-Elysees is called the "Chongsalayzay," with the accent on "Chong" and "lay." And this avenue by the way is one of the most beautiful in the world. It extends a mile and a quarter with stately trees on either side, and a spacious width which gives a wondrous sweep to the eye. It is ornamented at its upper end by the magnificent Arc-de-Triomphe—a mammoth arch 152 feet high erected to celebrate the victories of the Grand Army of France. It was begun by Napoleon I in 1806 and completed during the reign of Louis-Philippe. It is adorned by various groups representing stirring events in the history of those days. Nothing is without



Avenue des Champs—Elysées with the Arc-de-Triomphe.

significance in Paris, and every statue, and figure, and arch, and gateway is typical of some great event or great man.

Of special interest to Americans are the two monuments of Washington and LaFayette—the latter having been erected with funds contributed by the school children of the United States. When I looked upon that monument I loved every child who had helped to make it possible.

Running back from the Arc-de-Triomphe to the left is the Avenue du Bois de Boulogne which leads to the park of this name, a really wonderful park of about 2,500 acres, within which are located the two famous race courses of Auteuil and Longchamps. The former is used for hurdle and the latter for flat racing.

I shall never forget our ride through this park with all of its natural and cultivated beauty, with its wooded slopes graced by wild deer, and its appetizing cafe where we stopped for tea.

The Column Vendome is an immense shaft surmounted by a figure of Napoleon located in the center of the Place Vendome and noted for the fact that in the dark days of the Commune in 1871 the column was torn to the ground and the figure smashed. Of course, it was afterwards restored, but in the restoration the clothing of Napoleon was changed. In the original, Napoleon had on the gray cloak of the "Little Corporal." When renewed he was clothed in the garb of a commanding general, much to the disgust of the



Column Vendôme.

populace who preferred to see him as he first appeared when he won his fame. It is an invariable characteristic of the French people to undergo a revulsion of feeling after they have vented their wrath on any object whether it be a monument or a man. They banished Napoleon, and ended by giving him the most magnificent funeral of modern times. They did the same thing later to an even greater man than Napoleon when they forced the virile author of *Les Misérables* from his native land and cursed his very name only to subsequently strew the streets of Paris with immortelles in his honor. Too often the mob has ruled Paris, and almost always the mob is wrong.

We went to the Pantheon a building begun in 1764 and consecrated to the memory of great men. Here lie buried Voltaire, Marat, Mirabeau, Rousseau, Victor Hugo, etc.,—sufficient to make any building famous. The plan is in the form of a cross with a dome in the center rising 260 feet high. No one can imagine the stateliness of such a structure without walking under this dome and looking up. The interior has recently been decorated with frescoes representing the Childhood of Saint-Genevieve—the patron Saint of Paris,—Episodes in the life of this Saint, Episodes in the life of Saint-Louis, Joan of Arc, Charlemagne, etc.



The Panthéon.

One of the most impressive groups is that of Joan of Arc in which she is depicted respectively as a young girl, apparently without purpose, but impelled by an unseen force, next as a leader of the French Army, and finally being burned at the stake. The whole effect is awe-inspiring, and impressive.

Probably the most noted church in Paris is the Cathedral of Notre Dame. It was begun in 1163 under Louis VII, but they were in no particular hurry to do things in those days and it was not completed till 200 years later under Charles VII. Why they took so long I was unable to find out, but I foolishly began to

make comparisons. The city of Chicago is much less than half that old and yet we have erected a sufficient number of buildings to house two million and a half of people. But I do not suppose we have the art, the sentiment, or the patience to erect one Notre Dame. The front of the building is ornamented (every building in Paris is ornamented) with Statues of the Kings of France from Childebert to Philip-Augustus. There are two square towers in the front, one of which contains the largest bell in France, a sort of London "Big Ben." To the top of the tower lead 368 steps, which I did not climb. I took their word for it. In the center of the roof of the Cathedral is a spire about 400 feet high which of



Notre-Dame Cathedral.

course was destroyed in 1801, and which equally of course was reconstructed during the reign of Napoleon III. There is always "something doing" in Paris; there has not been a dull minute there in centuries. The interior of the church is composed of five naves—how many of the other kind have frequented there deponent sayeth not. The light is admitted by 113 windows including three magnificent rose-windows with stained glass of the XIII century. A visit to Notre Dame is worth a trip to Paris.

There are other churches of ancient date such as Saint Eustache constructed from 1532 to 1642, which was not a bad record for church-building in those days, only 110 years. Evidently there

was something in the contract which involved a penalty if they failed to finish it in time, otherwise they never would have rushed the work in that way. Then there is Saint-Germain—l'Auxerrois, constructed in the 13th century, but owing to the haste in which it was built—having been completed in a single century—it became necessary to alter it in the 15th and again in the 18th century. Such slipshod building as this is to be deprecated. Saint-Gervais-et-Saint-Protais was built during the 15th and 16th centuries, La Sainte-Chapelle in 1242, Saint-Laurent in 1429 and enlarged in 1548, 1595 and 1896. This congregation must have grown from time to time—a really remarkable thing to contemplate. But one of the most ancient churches in Paris is the Saint-Germain-des-Prés constructed during the 12th and 13th centuries on the site of that built by Childebert in the 6th century and of which yet remain the columns of the choir of rare marble, and the lower part of the tower. Think of a verdant Chicagoan looking at a column of marble carved thirteen hundred years ago, and still doing business at the old stand. Dates in Europe are reckoned not by fleeting years but by the solid centuries.

One of the modern churches of Paris is La Madeleine, built from 1763 to 1845. This church is noted as the place where the mob broke in at the time of the Commune, and massacred the congregation who had gone there to worship. Paris mobs are cruel as the crack of doom, and little did we think that we were destined to see some of them in action before we left there.

(To be continued.)

C. N. J.

BOOK REVIEWS.

LEHRBUCH DER GRENZGEBIETE DER MEDIZIN UND ZAHNHEILKUNDE
(COMPENDIUM OF THE BORDER REGIONS IN MEDICINE AND
DENTISTRY). Edited by Dr. Julius Misch, Zahnarzt in Berlin,
and published by Ferdinand Enke, Stuttgart, 1914.

This work is one of the most timely for the use of students and practitioners of both of these branches of the healing art, which of recent years have been brought more and more closely together in the realization of undeniable facts of interdependence, as established by close scientific observations and researches of some of the most ardent and reliable investigators. The field is young, and

much of great value has appeared promiscuously in current literature, yet there have been few attempts at bringing the matter under one cover where it might be of easy access to the busy practitioner.

The present volume, with its two well worked-out indices and its excellent bibliographical excursions, is the product of a number of co-workers of high standard in scientific thoughts and practical applications. The vast number of different subjects are grouped in chapters of excellent preciseness, such as the every-day practitioner needs to obtain the desired help and guidance. The work should go far to put him in a position of immeasurably increased value in his services to suffering humanity without an undue expenditure of time and vital energy.

HUGO FRANZ.

CORRESPONDENCE.

Boston, October 6, 1914.

Dr. C. N. Johnson, Editor DENTAL REVIEW,

Chicago, Ill.

Dear Dr. Johnson: I take this means of advising you relative to the dedication of the Forsyth Dental Infirmary for Children, as I feel sure that this notice will prove of interest to some of the readers of your DENTAL REVIEW.

The dedication is to take place on November 24th, and we wish to extend a cordial invitation to all the members of the dental profession to be present.

There will be many new and interesting features relative to dental equipment to be seen, and I am sure that those accepting our invitation will be well repaid. It will also give them an opportunity to see something of the inner workings of the institution, and the magnitude of our undertaking.

With kind regards, I am

Very truly yours,

HAROLD DEW. CROSS,

Director.

PRACTICAL HINTS.

Edited by J. E. Schaefer, D. D. S.

(This department is for busy readers. We want short articles containing practical hints—the shorter the better. No article must exceed 200 words, unless of exceptional merit. Every dentist has some useful hint that has been of value to him, and if he will only put it in print it may be of equal value to others. That is what this department is for. Due credit will be given for every article sent. Address J. E. Schaefer, 1745 W. Harrison St., Chicago, Ill.)

Xylol:—Dr. Zierold of Minneapolis has suggested the use of Xylol for dissolving out gutta percha cones in imperfectly filled pulp canals. It seems to work admirably.—*E. S. B.*

Root Fillings:—Pulp canal work daily assumes a more serious role, as we are confronted with an increasing number of cases where patients are suffering with systemic disturbances, which clear up when teeth with defectively filled roots are extracted and their diseased periapical areas curetted.—*E. S. Best, D.D.S., Minneapolis.*

Buccal Vent:—In the treatment of children's teeth—where caries has played havoc and putrescence is often present—I have found great comfort for them and the dentist in making a Buccal vent and filling the crown cavity, after giving a little attention to cleansing and rendering passive. Then a fibre of cotton antiseptized with Black's 1 2 3 in Buccal vent will make a happy child.—*Grafton Munroe, D.D.S., Springfield.*

Separating Modeling Compound Impressions:—In taking modeling compound impressions the compound may be easily separated from the cast if the impression is painted with a thin solution of shellac before it is poured. A most perfect impression may be obtained if the compound is vaselined and held under a stream of hot water for a few seconds just before the impression is taken.—*R. Davis, D.D.S., Minneapolis, Minn.*

Radiographed Root Canals:—When a pulp canal operation has progressed as far as seems possible, it does not necessarily mean that the operator has completed his operation. His next step should

always be to place fine gold wires in the canals and get his case radiographed. If the operation has been a prolonged one, it would be well to discontinue anyway and commence at the next sitting with renewed energy and determination.—*Elmer Best, D.D.S., Minneapolis.*

Don't Cast Aluminum to Porcelain Teeth:—The attachment of the teeth by casting directly to them is always to be condemned, even in partial cases, because the only possible advantage thus gained is the saving of the time required to vulcanize, and this is gained at the expense of the strength of the porcelain teeth, even though they may not be fractured, and is a procedure which is fraught with danger and uncertainty at all times, and under all conditions.—*H. J. Goslee, D.D.S., Chicago, Ill.*

Value of Flanges:—Value of the flanges on the sides of the posterior teeth on flat lower jaws demonstrated.

Attending a meeting of a State Dental Society last June, while at breakfast two mornings I ate a dish of blackberries. Each morning a dentist sat near me who had seen my jaw and plate. I called attention to what I had just eaten and asked if he did not suppose it impossible to eat that mass of seeds and not have them under the plate, and yet not a seed lodged there. And why? Because the cheeks closing on these flanges held the plate down.—*L. P. Haskell.*

Oral Hygiene:—Campaigns have been made against the evil effects of alcohol and tobacco; representatives of the sanitary department are sent in cases of epidemics to examine stocks of hogs and cattle when they run the risk of being destroyed, and their owners are obliged to take proper prophylactic measures to avoid spreading the disease. Unfortunately things are not the same for human beings; but let us hope that there will be a campaign in favor of oral hygiene to fight against the prevailing ignorance with regard to the evil consequences of this lack, as we may say without hesitation, that more physical deterioration has been produced by unsanitary mouths than by alcohol. This measure of first importance would be an economic as well as a sociologic one.—*Geo. A. Roussl, D.D.S., Paris, France.*

Neuralgia:—The neuralgias we have most to deal with are those connected with the fifth pair of nerves, due to irritations, and the patient may have any number or kinds of irritation. The patient may have an impacted third molar. He may have frequently a neuralgia whose cause is obscure. As a matter of fact, I believe impacted third molars and impacted teeth have been the cause of very many cases of neuralgia which have kept patients suffering for years, and up to the time the X-ray was introduced the profession was practically working in the dark. We may also have, and frequently do have, neuralgias induced by a suppurating pulp, one that is just beginning to take on a gangrenous condition. The irritation of that pulp will bring on a neuralgia which usually manifests itself on that side of the face along the jaw.—*C. N. J.*

Importance of Contour:—To obtain the proper contour we must strive to reproduce as nearly as possible the natural crown that has been lost. A close study of the remaining teeth should show the type of the mechanical elements, such as plains, surfaces and cusps, and what the function of each may be. If, however, the remaining teeth are in such a poor state of preservation that this is impossible (and it is a lamentable fact that this is often the case) we must use our own judgment as to the proper form. The age of the patient is one of the best guides to go by. A sixteen-year-old tooth would not be efficient in the jaw of an individual forty years old, or *vice versa*.

A contour, then, must be such as to afford good contact points and yet preserve the normal interproximal spaces. The buccal and lingual surfaces must be so formed as to protect the gingival tissues from the crowding of food upon the gingiva.

The articulation must be so adjusted that the occluding plains of each cusp will get no more than its share of work, and the stress must be directed along the long axis of the tooth.—*Crown Clinic, Ill. State Soc.*

A Boomerang:—We frequently come in contact with those cases where the teeth are worn off to the gum line. This is caused by a nervous rocking of the teeth together, or some unnatural masticating forces, and as a usual thing, there is very little caries present. Here is another case where the dentist must be his own architect,

contractor and builder. His landmarks of what may have been the original shape, size and color are practically all gone; he must then create a something that will replace that which is lost, and what is more important, he must replace it with that which will become a part of the patient's general character. Of course, he might do as I have seen done—take an impression and some wire measurements of the teeth and send it to the dental laboratory man, let him be the architect and builder; he is the man who reads character by mail (that is, when the mail contains the money) and he will return his diagnosis and prognosis in a full set of bright gold crowns, all ready to wear; and the dentist has only to mix a little cement, stick them on one by one and the patient is soon all decked out in his new teeth. He goes out of the office thinking he has a gold mine, a treasure.

Alas! This poor soul awakes some day to find holes worn in his gold mine and treasure; he discovers he has a gold brick instead and the boomerang comes back upon the maker.—*P. A. Pyper, D.D.S., Pontiac, Ill.*

A Method of Treating Pyorrhea:—First sitting: Examine mouth and mark on examination sheet all hopelessly loose teeth, decayed or abscessed teeth, malocclusion, ill-fitting crowns and bridges. Agree on fee per *sitting*, "which sitting should never exceed one hour of time." Require a skiagraph to be obtained by the next sitting. Spray the gums with some mild antiseptic, using not over fifteen pounds pressure. Paint the gums with tincture of iodine. Dismiss the patient and charge her up with one sitting.

Second sitting: Spray mouth with normal salt solution and paint gums with tincture of iodine. Extract all hopelessly loose teeth, remove all ill-fitting crowns and bridges (and that means most of them), and clean out all cavities and fill with cement or amalgam. Should the skiagraph disclose abscessed or necrosed condition, this should have, at least, some attention at this time. Spray the mouth with some mild antiseptic and dismiss the patient.

Third sitting: Spray the mouth with normal salt solution, to which has been added some aromatic water, such as peppermint, cinnamon or wintergreen. We are now ready to begin scaling and polishing the teeth. Let us make "one tooth at a time" our motto, and that tooth should be scaled and polished to completion before beginning another. First paint the soft tissues around the tooth

with tincture of iodine and then proceed with the scaling. Use great care not to lacerate the tissues more than possible. Use only sterile water to wash away the debris during the operation. If the work is done thoroughly, I find in a case of the second stage, about two teeth will require an entire sitting for the average operator. I usually begin with the lower centrals. If they are loose, when I have finished all I can do in one operation, I ligate them in such a manner as to hold them steady. Do not flood the pockets with antiseptics. While working with them I use water or salt-solution to wash away the debris, but when I am done I want the pocket to fill up with nature's own dressing—blood clot. I never want to explore that cavity again. Let it have a chance to get well. I continue with the remaining teeth at subsequent sittings, until all have been cared for.

Remember to first flush out the mouth, or preferably spray with normal salt solution, then paint gums around teeth to be worked on with tincture of iodine. There should be no need of disturbing these teeth again. After all teeth are cared for as stated, if necessary, construct and set your retaining appliance and correct malocclusion with anatomically constructed fillings, crowns, and bridges, constructed along sanitary lines. At the very first sitting, and at every subsequent one, preach into the patient the gospel of oral hygiene. Prescribe a suitable antiseptic mouth wash and teach her how and when to clean her teeth. I am aware that this method may receive severe criticism. I am a general practitioner and cannot vouch for a scientific accuracy in all my work, but I do in most cases get very pleasing results and a compensation commensurate with the service rendered.—*V. B. Newell, D.D.S., Stafford, Kansas.*

MEMORANDA.

[Society notices will be given insertion in this department free of charge. Subsequent insertions will be charged for at the rate of \$2.00 an inch.]

CHICAGO DENTAL SOCIETY.

The annual clinic of the Chicago Dental Society will be held in the Hotel La Salle, January 29 and 30, 1915. The officers and committees are planning a program for this meeting which they feel sure will be of interest to every dental practitioner who can arrange to be in Chicago at that time.—*T. L. Grisamore, President; P. B. D. Idler, Secretary.*

IOWA STATE BOARD OF DENTAL EXAMINERS.

The next meeting of the Iowa State Board of Dental Examiners for the examination of candidates will be held at Iowa City, Iowa, commencing Monday, November 30. For application blanks and particulars, write the Secretary, J. A. West, 417 Utica Building, Des Moines, Iowa.

ILLINOIS STATE BOARD OF DENTAL EXAMINERS.

The next meeting of the Illinois State Board of Dental Examiners, for examination of applicants for license to practice dentistry in the State of Illinois, will be held at the Chicago College of Dental Surgery, Chicago, Ill., commencing at 9 A. M., November 9, 1914. Application, together with fees, \$26.00, etc., should be filed with secretary at least five days prior to date of examination.—O. H. Seifert, Secretary, Springfield, Ill.

MEMORIAL EXERCISES IN HONOR OF THE LATE DR. GEORGE E. HUNT.

The dental profession of Indiana will have a memorial service in honor of the memory of Dr. George Edwin Hunt, to be held in the auditorium of the Masonic Temple, North and Illinois Streets, Indianapolis, Ind., on the evening of November 21, 1914, at 8 o'clock. The principal address will be by Dr. John N. Hurty. The friends of Dr. Hunt are cordially invited to attend this service.—Carl D. Lucas, Chairman of Committee.

TEXAS STATE BOARD OF DENTAL EXAMINERS.

The next regular meeting of the Texas State Board of Dental Examiners will be held in Cathedral Hall, Galveston, Texas, beginning Monday morning, December 14, at 9 o'clock. No interchange of licenses with other states. Applications, accompanied by the fee of \$25.00, should be in the hands of the secretary not later than December 10. For further particulars, or for official application blank, address the secretary.—C. M. McCauley, Secretary, 434 Wilson Building, Dallas, Texas.

THE NATIONAL ASSOCIATION OF DENTAL FACULTIES.

The National Association of Dental Faculties will hold its meeting on the 26th and 27th of January at Ann Arbor, Mich. Headquarters, Allenel Hotel. This meeting will precede the Teachers' Association meeting, which will be held from the 28th to the 30th. Besides the regular business, there will be several papers of interest to educators read before the association. The executive committee meets at 9 o'clock, Tuesday, the 26th. Regular session will open at 10.—B. Holly Smith, Chairman of Executive Committee; Charles Channing Allen, Secretary.

WISCONSIN STATE DENTAL SOCIETY.

The following resolution was adopted by the Wisconsin State Dental Society at Fond du Lac, July 16, 1914:

Whereas, Almighty God in His infinite wisdom has seen fit to remove from the scene of his earthly labors, Dr. George Edwin Hunt, M.D., D.D.S., and

Whereas, The Wisconsin State Dental Society desires to record its appreciation of him as a man and its sense of sorrow at his death; therefore, be it

Resolved, That the Wisconsin State Dental Society extends to the family of the deceased their sincere sympathy in their bereavement and that this resolution be spread upon its minutes and a copy be sent to the family and to the professional journals for publication.—W. F. Fauts, Charles L. Babcock, E. A. Geilfuss, Committee.

OHIO STATE DENTAL SOCIETY.

The forty-ninth annual session of the Ohio State Dental Society will be held in Memorial Hall, Columbus, December 1, 2 and 3, 1914. Papers will be read by Dr. William A. Griffin, of Detroit, on "Technic for Taking Impressions and Making Models for Constructing Artificial Dentures," giving demonstrations with moving pictures; Dr. H. W. McMillan, of Cincinnati, on "Diagnosis and Treatment of Trifacial Neuralgia"; Dr. W. W. Curtiss, Greenfield, Ohio, on "Conservation vs. Radicalism"; Dr. J. R. Callahan, of Cincinnati, "A Lantern Lecture on the Use of Rosin in Operative Dentistry." A selected list of progressive clinics will be given on Wednesday forenoon, and general clinics Thursday forenoon. One evening will be given to a Health Conservation Conference, to be participated in by all professions and interests devoted to the furtherance of human health and welfare. A cordial invitation is extended to society members from other states.—F. R. Chapman, Secretary.

NEW JERSEY BOARD OF DENTAL EXAMINERS.

The New Jersey State Board of Dental Examiners will hold their regular business meeting and examinations in the Assembly Chamber of the State House, Trenton, N. J., December 7, 8 and 9, 1914. License fee, \$25.00. No interchange of license. Certificate of four years' course of study in approved high school or equivalent, from Superintendent of Public Instruction, required; also a dental degree from an approved dental college. Examinations, theoretical and practical. Practical tests required: The insertion of a gold filling in the proximal surface of a tooth; also a bridge consisting of three or more teeth, exclusive of abutments, and one Richmond crown (gold metal), mounted and articulated. Filling and soldering must be performed before an examiner. Applications must be filed *complete* at least ten days before the date of the examination with the secretary. Attention is directed to the following requirement: All applicants for a license to practice dentistry in New Jersey "shall present to said Board a certificate from the Superintendent of Public Instruction showing that before entering a dental college he or she had obtained an academic education consisting of four years course of study in an approved public or private high school or the equivalent thereof." In accordance with the above proviso, the secretary will issue application blanks to applicants only upon presentation of the required certificate from the Superintendent of Public Instruction, Trenton, N. J. For further particulars apply to Alphonso Irwin, D.D.S., Secretary, 425 Cooper Street, Camden, N. J.

RECENT PATENTS OF INTEREST TO DENTISTS.

- 1,090,126. Tooth brush, F. Reichmann, Albany, N. Y.
- 1,091,201. Tooth brush, C. E. Carroll, Newport, Ark.
- 1,091,314. Tooth brush, C. H. Erickson, Denver, Colo.
- 1,091,209. Tooth brush, M. E. Gates, Helena, Mont.
- 1,090,039. Composition of matter to be used for the manufacture of plates for artificial teeth, R. H. Newton, Montpelier, Vt.
- 1,091,446. Removable saddle for fixed dental bridges, A. L. Van Arsdall, Kansas City, Mo.
- 1,086,006. Tooth brush, D. Weiss, Cleveland, O.
- 1,086,887. Dental handpiece mirror, W. H. Bittman, Philadelphia, Pa.
- 1,086,659. Tooth brush holder, F. Ferenc, Kenmare, N. D.
- 1,086,394. Blowpipe stand, J. Murphy, Hartford City, Ind.
- 1,087,978. Dental cabinet, R. B. Power, Green Bay, Wis.
- 1,088,962. Aseptic dental waste receiver, F. B. Bostwick, Plainfield, N. J.

- 1,089,201. Artificial tooth, A. E. Follows, Wavertree, London, England.
- 1,089,095. Cuspidor, H. E. Weber, Canton, Ohio.
- 1,091,789. Dental instrument, B. T. Andren, Milwaukee, Wis.
- 1,092,014. Tooth brush, T. L. Briggs, Brooklyn, N. Y.
- 1,091,852. Retaining means for sets of teeth, J. Lautenburg, New York, N. Y.
- 1,091,522. Moistening device for dental engine handpieces, D. W. McLean, Mount Vernon, N. Y.

DESIGNS.

- 45,180. Tooth brush, H. Clapp, Boston, Mass.
- 45,198-9. Tooth brush, A. J. McDonagh, Toronto, Canada.

Copies of above patents may be secured for fifteen cents each, by addressin~ John A. Saul, Solicitor of Patents, Fendall Bldg., Washington, D. C.

"THOSE WISHING TO REGISTER IN INDIANA PLEASE NOTICE.

"In compliance with Section 9, an Act to regulate the practice of dentistry in the State of Indiana, approved March 8, 1913. On or before the 31st day of December, of each year, each dentist now licensed or subsequently licensed to practice dentistry in this state shall transmit to the Secretary of the State Board of Dental Examiners his signature and address together with the fee of one dollar and the number of his or her registration certificate, and receive therefor a renewal license certificate. Said renewal license certificate shall be at all times properly displayed in the office of the one who is named in the license, and no person shall be deemed in legal practice who does not possess such renewal certificate. Any license granted by said board shall be cancelled and annulled if the holder thereof fails to secure the renewal certificate herein provided for within a period of three months after December 31st of each year; PROVIDED that any license thus cancelled may be restored by the board upon the payment of a fee of five dollars, if paid within one year after such cancellation. Notices will be mailed to all dentists registered in Indiana to their last known address, on or before December 31st, 1914. Failure to receive such notice will not be an exemption or an excuse for non-payment. In such cases all persons should notify the Secretary, giving their correct address. This also applies to all those living outside the state. Fred J. Prow, Secretary, Bloomington, Indiana."

DR. TOMPKINS' ARTICLE.

Referring to the article by Dr. H. E. Tompkins, page 943 October number, Dr. W. H. DeFord of Des Moines, Iowa, makes the following correction:

"The A. C. Clark Co. is given credit for only one appliance, namely, 1911. I happen to know that the Hurd Gas Apparatus, a Clark appliance, patent applied for in 1902, was a Clark appliance. Shortly after that, the Clark Correct Outfit and then the Clark Improved Outfit appeared. These were followed by the Clark-Hurd Gas Outfit, then the Clark New Model Gas Apparatus. No more valuable appliances, at the time they appeared have ever been given the profession, and certainly should not be over-looked."

THE DENTAL REVIEW.

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No. 12

PRESIDENT'S ADDRESS.*

BY DR. W. S. DAVENPORT, PARIS, FRANCE.

Members of the American Dental Society of Europe and honored guests.

The American Dental Society of Europe is composed of men from many countries, most of whom sought dental instruction and inspiration in American institutions, where men of inherent ingenuity, refinement and artistic development have been the teachers and makers of dentistry.

This body of international men for a period of forty-one years (like our pioneers) have uplifted the standard of dentistry, as well as the social position of the dentist abroad, and have oft times played an important diplomatic role, through their influence in being always in personal contact with the heads and important people of all countries, who have acknowledged the importance of dentistry by their assistance to its cause, and as tokens of their appreciation have conferred numberless honors on the members of our profession.

Through the influence of this international fraternity, there has been organized the International Dental Congress, and the International Dental Federation.

The way is now paved by Geheimrat Dr. N. S. Jenkins and others for an international interchange of professors in the dental schools. Are we not justified in working for an international standard for dental education?

Since the study of medicine and dentistry were made side by side in the universities, our professional standard is better known, and the two professions have become indispensable to each other, both in diagnosis and treatment of disease. The system of educa-

*Read before the American Dental Society of Europe, July 30, 1914.

tion adopted in Germany and a few other countries to facilitate simultaneous study of dentistry and medicine, seems to be more in accord with modern requirements of dentistry.

With the development of our specialty and with our ever increasing responsibilities, if we wish to command the respect and authority we require, and be able to fill the position awaiting us, it is inevitable that our qualification should be equal if not superior to the Doctor of Medicine. The predictions of Osler, Mayo, and others only prove that the dentist's appeal is at last being heard.

Are our methods of practice and of securing remunerations for our services as dignified as those of other professions?

I have often wondered why so many dentists adopt the method of charging by the hour for their services, or an established fee for treatments, irrespective of the financial condition of the patient. What should we think of an eye, ear, throat, or any specialist who charged by time for his operations?

Is it, then, surprising with such menial and subservient methods that our patients become exacting and most indelicate at times, keeping an account of what we accomplish and the time spent, or is it a wonder patients so indulged are undesirable to men who are masters of their practice, who justly value their services and are able to inspire confidence in their patients?

There is no limit to the possibilities of advanced surgical and artistic skill, we must not allow tradition to prevent us from educating the public to our highest ideals, and to the real value of our services, nor limit our sphere of action through insufficient qualifications or legal restrictions.

Are we living up to the artistic standard of the porcelain school? I have been told by the dental supply people there is almost no sale for furnaces or porcelain materials. Does this mean that students are not being properly taught porcelain work, and that the young dentists are no longer equipped to perfect themselves in the highest branch of dental art?

Porcelain inlays in the hands of an expert have no equal, while silicious materials, even with porcelain and enamel names are at best only cement, and though most serviceable at times, they are not materials on which a young man can afford to build a reputation.

The example set by Horace Wells should be constantly in our minds. There is nothing we can do that will help our cause, or benefit humanity more, than for our profession to continue foremost in the use of the means now at hand, to alleviate the pain of our operations.

Gentlemen, there is a question I feel my duty, as president, to bring forward. You are no doubt all aware of the ruling of the committee of organization of the International Dental Congress (about to be held in London) in regard to the admission of members practicing in the United Kingdom.

This *unfortunate interpretation* of the *rules* of the *F. D. I.* governing the organization of international congresses has reflected on the honor of a few of our most ethical men practicing in England. It is a question of adverse criticism by many, and a great humiliation to every American graduate, also a real grief to the organizing members of the true international brotherhood, who have devoted their lives to the cause of international dentistry in the highest ethical sense.

The A. D. S. E. at one time was recognized for the part they played in the organizing of the F. D. I. and were treated as a national society, and our members were able to make their application for membership to the International Dental Congress through the secretary of the A. D. S. E.

There has been no change in the rules of the F. D. I. necessitating a discontinuance of that privilege. The present condition is this, the local committee of the International Dental Congress has ignored all precedents and rules established by the F. D. I. They have been unable to accept intervention and frankly admit with explanations and expressions of regret, that the extraordinary conditions existing in England make it impossible to make any concessions without causing a complete resignation of the committee.

Through the London Dental Club, the American National Dental Association have upheld their declaration of rights, and I consider this support for the moment should in a degree compensate for what has taken place.

This is the first international congress to be held in England, which may explain the reason for confounding their own national difficulties with international questions.

I consider this question should be treated in a spirit of consideration and conciliation. Can we not now afford to be magnanimous and use our influence for the congress and the cause of international dentistry?

To prevent future misunderstandings and complications to the members of the A. D. S. E., it has been suggested if possible to ally our society with the national society of America, or that each member should make it a point to join his own national society, thus being assured a protection or a sponsor when required.

Our members are often involved in difficulties through the contract question with associates. A well established practice is an important asset. It is generally considered that ten years are necessary for the building of a practice.

The uncertainty of the position of a man requiring an associate has developed abroad a system of contract which has been at times rather severe in its working and has brought about much discord and misunderstanding in the profession.

There are different methods of acquiring a practice:

Firstly—Buying the good will of a practice outright.

Secondly—By associating with a successful practitioner, with the ultimate view of acquiring a practice.

Thirdly—A man with certain means and protection who builds his own practice.

Fourthly—A person who accepts trial position and takes with him all he can possibly appropriate.

The association of an experienced and successful practitioner and an assistant with fresh energy and ideas should be of mutual assurance and advantage. No contract can possibly terminate successfully (even with a satisfactory income) that deprives a man of his freedom or an assured position at a definite time. Contracts should not be made hastily, as some successful men have no ability in turning over patients to others, while assistants are oftentimes too independent to work harmoniously with any one.

Fortunately, there are a few contracts in effect that seem to fulfill all requirements which enable a young man to gradually acquire a practice and an independent position where with an assured future he gives his best to his work.

It is the general opinion that dentists abroad are especially favored. Many of us receive communications from young gradu-

ates, and even from men of certain experience and reputation, soliciting position or asking the conditions for practicing abroad.

The real difficulties of leaving one's native land and making a successful career in a foreign country are becoming better understood. There is nothing impossible, but I assure you a man who qualifies and makes a success now in many of the European countries deserves great praise.

The policy adopted by this society two years ago was on the broadest possible line. May I urge that each member will work to that end, and assist in increasing the membership, giving the society the advantage of all desirable candidates. I trust the younger members will take an active part in the discussions and all work of the society.

Let us follow the suggestions of our last president, Dr. Webster and try to systematize the work of the society, so as to derive the greatest possible social and practical as well as scientific advantages in the limited time we have.

The local societies and clubs in the large centers of Europe, also societies for specialists, are proving a great advantage to the Mother Society, and the closest possible relations should be encouraged. It is most gratifying that we are able to have our demonstrations this year conjointly with those of the European Society of Orthodontia.

In "La Belle France," notwithstanding the difficulties of the language, our position is always understood, and our task has been facilitated by the never varying courtesy and refinement of the French who were the first to discover and acknowledge the works of our masters.

It is regrettable this meeting should fall on the same date as the meeting at Le Havre, nevertheless the kind offer of our French confrere to provide us with a suitable place for our demonstrations at the "Ecole Dentaire de Paris," and the ideal manner of assisting us in every detail is another indication of the ever fraternal feeling that has always existed and will continue to exist between the French and foreign dental professions.

Gentlemen, many of you have traveled far to be with us, and it is a special privilege for us to welcome you to the meeting and to Paris.

RESEARCHES UPON THE ENTAMOEBA BUCCALIS.*

BY DR. ANGELO CHIAVARO, ROME, ITALY.

Official Professor of Dentistry in the Royal University of Rome.

(Work executed in the R. Institute of Comparative Anatomy of the University of Rome, directed by Prof. B. Grassi.)

As a few authors, and among them, as far as I know, no dentist, have studied the *Entamoeba buccalis*, which has a greater diffusion than is generally supposed, I took the advice of Prof. B. Grassi and have executed in his laboratory researches upon this protozoon.†

I wish to thank my illustrious Master for the hospitality and advice given, and his Aiuto Dr. Anna Foà, who was a great help to me in my researches, for her special dexterity in this matter by

†For those who are not specially well acquainted with such studies I think it is as well to remember that the protozoa which are found in the human mouth belong to the class of the Rhizopoda and of the Flagellata.

To be precise this is their systematical position:

Class	Order	Gender	Species
Rhizopoda	Gymnamoebinae	Entamoeba	Buccalis
Flagellata	Eufagellata	Monocercomonas	Hominis

With the most modern authors we no longer include in the class of Flagellata the spirochaeta, of which in the oral cavity there are various species.

Among the flagellata, then, it has been observed in the mouth, up till the present, only the *Monocercomonas hominis*, Grassi, 1882. The monocercomonas is more or less pear-shaped, length 10 to 15, in width 7 to 10 micromillimetres; it has at its anterior extremity four flagella, and a fifth one from the anterior extremity goes along all the body to which it is attached by a very thin undulated membrane, and terminates free by its last small portion at the posterior extremity of the body. It seems that the *Monocercomonas hominis* is identical with the *Trichomonas vaginalis*, Donné, 1837, to the *Cercomonas hominis*, Davaine, 1854, to the *Trichomonas intestinalis*, Leuckart, 1879. This flagellatum has been found in the mouth by Rappin and by Grassi. I have often found it in the microscopical preparations direct from the mouth of the *materia alba* of the teeth, and I hope to be able later on to study its morphology and to establish whether it has, or not, a pathogenic action.

*Read before the American Dental Society of Europe. July, 1914.

reason of important studies previously made by her upon other protozoa.

By the name of *Entamoeba buccalis* was described in 1904 by Prowazek an *Amoeba* which he found in the carious cavities of the teeth. This author in a brief note described the form and process of agama reproduction by a simple division in two.

In 1905 this animal was again found by Leyden and Loewenthal in a case of carcinoma of the mouth in a woman of 60 years of age. These two authors in describing this case add some particulars to the descriptions made by Prowazek and they point out some other particulars upon the division of the nucleus. Upon the etiological explanation of the *Entamoeba* in such a case the two authors say that it was not found among the tissues of the tumor, but only in the detritic mass, where it was very abundant; they exclude then any etiological relation with the carcinoma.

Since then nobody has studied this protozoon, which has not even been nominated in the most recent works, in which are treated the *Entamoebas* of man.*

Probably the *Entamoeba buccalis* described by Prowazek is identical with the *Amoeba gingivalis* Gross (1849), with the *Entamoeba buccalis* Sternberg or Steinberg (1862)†, with the *Amoeba dentalis* Grassi (1879), and with the *Amoeba* found in 1892 by Flexner of Baltimore in an abscess of the inferior maxilla.

Although the authors who have studied the *Entamoeba buccalis* have tried to establish a different character from the other *Entamoebas* of man, nevertheless their descriptions do not exclude the suspicion that rather than being of a distinct form one had to do with different stages of development of some of those *Entamoebas* which are guests of the intestine. This suspicion could be more certainly confirmed by the fact that the *Entamoeba buccalis* was never found in a state of encystment. Its relation to the diseases of the mouth remained unknown.

Having present before me all these known facts, with my researches I decided

*It is not spoken of, for example, in the work of W. A. Kuenen and N. H. Swellengrebel, "Die Entamöben des Menschen und ihre praktische Bedeutung." Centr. f. Bakt. etc., I Abt. Orig., Bd 71, Heft 5-7, 15 November, 1913.

†The work is in the Russian language and could not be directly consulted; the name of the author is written in both ways in different treatises.

1. To study the morphological characters of the *Entamoeba buccalis*.

2. To deduct, if possible, by the examination of the morphological character some criterion for establishing the fact whether or not this protozoon should be really considered as a distinct form.

3. To observe the relations between the presence of the *Entamoeba buccalis* and the condition of the teeth and in general of the oral cavity, for determining if the *Entamoeba* has or has not a pathogenic action.

I. OBSERVATIONS UPON THE MORPHOLOGICAL CHARACTERS OF THE ENTAMOEBA BUCCALIS AND UPON ITS REPRODUCTION.

The material was gathered from 68 cases, some of them with sound teeth and others with dental diseases. With the material taken in various ways from the mouths of these patients I have made many microscopical preparations on slides. Some of the cover-glasses were treated by the dry method and colored with the mixture of Giemsa* in the usual way. Some others were fixed with the liquid of Schaudinn (sublimite alcoholic-acetic) and stained with the *Hematoxilin* of Ehrlich or with the *Ferric Hematoxilin* of Heidenhain. I could only make a few observations upon the living *Entamoeba*, because in the majority of cases I was forced to fix in haste the material in the presence of the patient, with the purpose of examining the preparation during my leisure time. However, I have seen the movement of the *Entamoeba* and I have verified, as already others have noticed, that the *pseudopods* are always few and lobular.

In the fixed and colored microscopical preparations the *Entamoebas* are almost round and oval. The diameter of the almost round forms and the minor axis of the oval ones vary from 5 to 20 micromillimeters. According to other authors, the variations are greater (from 6 to 33 micromillimeters), and altogether the dimensions are larger. This fact perhaps depends upon my measurements being taken upon fixed material, and the measurements of others perhaps were taken upon living animals.

In the fixed preparations the difference is no longer noticeable between the ectoplasm and endoplasm, which are noticed in

*It is a mixture (sold by Grüber) of Azur II—eosine, dissolved in glycerine with an addition of metallic alcohol (Carazzi e Levi—"Tecnica microscopica, 2. Ediz. Milano 1911, page 327).

the living animal. But while the figures given by Leyden and Loewenthal the *Entamoebas* designed from preserved colored preparations are entirely different from those designed from living individuals, I find in my preserved preparations figures which resemble those seen in the preparations direct from the mouth.

Generally the *Entamoeba buccalis* has only one nucleus, but sometimes there are two (Figs. 4, 8, 9).

The nucleus, whichever is the method used for the fixation, shows more or less the same characteristics; that is, round, relatively small, vesicular, with a well distinguished membrane and a very clear cariosom (central corpuscle).

The chromatic nucleus substance, always very scarce, is divided between the cariosom and some small masses adhering to the membrane. These masses sometimes are not distinguishable (Fig. 7), sometimes there are two, situated one against the other (Fig. 2); in some other cases there is an unique mass on a side (Fig. 3). The cariosom sometimes appears to be unique, almost round (Figs. 2, 3, 5), sometimes it is divided into two symmetrical halves (Fig. 1), sometimes it is formed by three fragments (Fig. 8). Some threads of chromatic substance go from the cariosom to the membrane (Figs. 5 and 7).

But in general the structure of the nucleus can be well observed only on the microscopical preparations colored with the ferric hematoxilin of Heidenhain. The chromatic substance and nucleus membrane are colored in a red-violet and the remainder of the nucleus in blue, more or less deep, if the preparation is colored with the *Giemsa mixture*; if the hematoxilin of Ehrlich is used the nucleus remains very pale and often is hidden by nourishing vacuoles, which are scattered all over the protoplasm and which take the color intensely.

It is a fact worthy of special notice that there are a very great number of bacteria enclosed in the protoplasm, evidently ingested by the *Entamoeba* (Figs. 9 and 10).

The vacuoles of respiration are always absent.

Sometimes also the nourishing vacuoles may be absent (Figs. 7 and 8), but sometimes they are in great number. In general the larger in dimension the individual is, the more numerous they are. Sometimes in only one *Entamoeba* there are more than twenty. In Fig. 1 there are eight, but in the animal they were more numerous;

they were reduced in the design for the sake of a clearer representation.

In regard to the *reproduction* I remind you that in the Entamoebas up till now is known the simple division in two, which for the first time was described and illustrated by Ptowazek. The process happens in the following way: the cariosom indirectly divides itself; one equatorial plate and one spindle are formed in it, while all the rest of the nucleus remains as it is. But after the separation of the equatorial plate into the lateral plates all the nucleus divides itself in two.

Besides this, according to Loewenthal, there is another kind of nuclear division, called the direct division; the cariosom would remain for a long time and the nucleus would divide itself from the exterior to the interior.

There is a third process: from the nucleus, and precisely from the substance, which with the *Giemsa* takes the blue color, generally considered as a non-chromatic substance, small particles would detach themselves, passing to the protoplasm and gathering together at the margin. Loewenthal adds that the permanent form probably is formed in this way, but this process seems very strange and the permanent form was not observed by him.

I did not indulge myself in the study of the various modes by which the phenomenon of reproduction is evolved, but I have found the figures of the division in two cases in which the Entamoebas were abundant.

II. RESEARCHES UPON THE IDENTIFICATION OF THE ENTAMOEBA BUCCALIS AS A DISTINCT FORM.

As far as I have explained up till now my observations confirm those of other authors, but I have been able to add something new, and that is the demonstration that the durable form of the *Entamoeba buccalis* develops in the oral cavity.

Figures 9 and 10 show this process of encystment. They are designed from a microscopical preparation stained with the *Giemsa mixture*; the material was gathered from a case of pyorrhea alveolaris,* and the Entamoebas were very numerous.

In Fig. 10 the encystment process is hardly initiated; a periferic thickening starts to show itself in the protoplasm, but a layer

*Case 66, in the table.

clearly separated from the under one cannot be distinguished. This external layer separated from the remainder can be well observed in Fig. 9; evidently it forms the membrane of the cyst.

It would be very interesting to follow more deeply this phenomenon, but I think the simple fact is really worthy of notice that the *Entamoeba buccalis* gets into a state of encystment in the oral cavity. This destroys the doubt that this protozoon represents one of the stages of other *Entamoebas* of man, which doubt could not be excluded by the simple morphological character.

It is right to think that the propagation of the *Entamoeba buccalis* happens directly from individual to individual.

III. THE ENTAMOEBA BUCCALIS IN RELATION TO THE CONDITIONS OF THE TEETH AND OF THE ORAL CAVITY.

The material for the researches on the *Entamoeba buccalis* was gathered from the mouths of patients of my private professional practice and of patients of the Royal Dental Dispensary at the Dental School at the Policlinic Umberto I in Rome.

The way the material was gathered and the results of the researches made are shown in the following table:

TABLE OF OBSERVATIONS MADE UPON SIXTY-EIGHT CLINICAL CASES
FOR THE RESEARCHES OF THE "ENTAMOEBA BUCCALIS."

Number of order.	Initials of the names of patients from whom the material of observation was taken.	Material examined and conditions of the teeth and mouth from which it was gathered.	Result of the microscopical examination upon the research of the "Entamoeba buccalis."
1	G. S.	<i>Materia alba</i> * gathered with dental floss silk from the interdental spaces of the lower incisors. Many teeth are absent; those which remain are sound and kept pretty well clean.	absent
2	Id.	<i>Materia alba</i> taken from the interdental spaces of the preceding case after having purposely left the teeth without cleaning for one week.	few
3	G. M.	Soft material taken from a carious cavity of the upper left central incisor with living pulp; teeth in bad hygienic condition.	absent
4	A. C.	<i>Materia alba</i> taken from under the swollen gum margins; teeth in the worst hygienic conditions.	few
5	V. P.	Pus from a gum-pocket of pyorrhea alveolaris.	many
6	G. C.	Soft material taken from a carious cavity of left lower first molar.	absent
7	Id.	Soft material taken from the root canal of an extracted root.	absent
8	I. T.	Pus from a gum-pocket of pyorrhea alveolaris.	many
9	T. F.	Liquid squeezed from a piece of decalcified dentin of the upper left third molar.	absent
10	Id.	Gangrenous dental pulp of the upper right second bicuspid.	absent
11	P. E.	Pus from a gum-pocket of pyorrhea alveolaris.	many
12	M. S.	Liquid material squeezed from a piece of decalcified dentin of the upper left second molar.	absent
13	L. V.	Soft material from a deep carious cavity of the upper left first molar with gangrenous dental pulp.	few
14	Id.	Soft material from a deep decayed cavity of the lower left first molar with gangrenous pulp.	few
15	A. S.	Pus from a gum-pocket of pyorrhea alveolaris.	many

*The *materia alba* is a soft, whitish, sticky substance deposited in the interdental spaces and upon the surface of the crowns of teeth, specially near the margin of the gum; it is prevalently formed by soft salivary deposits, mucous secretions, epithelial cells of the mucous tissue and alimentary debris more or less decomposed; in it numerous species of micro-organisms are living.

Number of order.	Initials of the names of patients from whom the material of observation was taken.	Material examined and conditions of the teeth and mouth from which it was gathered.	Result of the microscopical examination upon the research of the "Entamoeba buccalis."
16	S. T.	Purulent material gathered around the root of the upper right third molar affected with pyorrhea and so loose that it was extracted with the fingers without a drop of blood.	few
17	S. D.	Soft material from a deep decayed cavity of the upper right second bicuspid with gangrenous pulp.	few
18	M. S.	Pus from a gum-pocket of pyorrhea alveolaris.	few
19	E. N.	Soft material from a carious cavity of the lower right second temporary molar.	absent
20	R. C.	Material from a carious cavity of the lower right third molar with living pulp.	absent
21	C. G.	<i>Materia alba</i> taken from the surface of the lower anterior teeth; sound teeth not kept clean, but with small quantity of tartar.	few
22	C. G.	Hard triturated tartar taken from the labial surface of the upper central incisors.	absent
23	Id.	Soft material from a deep decayed cavity of the upper left first molar with gangrenous pulp; the teeth of the left side had been functionless for a long time.	few
24	S. R.	Yellow-orange deposit scraped from the vestibular surface of the posterior teeth of the side of dental arch left functionless.	many
25	Id.	Liquid squeezed from a piece of decalcified dentin of a deep decayed cavity.	absent
26	F. S.	Pus from a gum-pocket of pyorrhea alveolaris.	many
27	M. C.	Pus and soft material taken from an alveolar sequestrum of the inferior left posterior region of dental arch; the sequestrum was the cause of a cutaneous fistula opened in the left submaxillary region.	many
28	B. G.	<i>Materia alba</i> gathered from the interdental spaces of the lower incisors of a mouth kept in bad hygienic condition.	few
29	F. V.	Pus from a gum-pocket of pyorrhea alveolaris.	many
30	S. D.	<i>Materia alba</i> taken from the crown surface of an upper sound cuspid; mouth with many decayed teeth.	absent
31	Id.	Soft material from a deep carious cavity.	absent
32	P. N.	Squeezed liquid from a piece of decalcified dentin taken from a deep carious cavity.	absent
33	Id.	<i>Materia alba</i> from anterior teeth.	many
34	Id.	Hard yellowish triturated tartar, gathered around the free roots of the lower right first molar.	absent

Number of order.	Initials of the names of patients from whom the material of observation was taken.	Material examined and conditions of the teeth and mouth from which it was gathered.	Result of the microscopical examination upon the research of the "Entamoeba buccalis."
35	F. P.	Pus from a gum-pocket of pyorrhea alveolaris.	many
36	F. A.	Greenish deposit scraped from the labial surfaces of the upper anterior teeth in bad hygienic condition.	absent
37	Id.	Soft tartar and pus taken from the root and from a pyorrhic gum-pocket of a lower anterior tooth.	many
38	G. B.	Hard triturated tartar and pus taken from the lingual surface of pyorrhic lower incisors.	few
39	F. C.	Pus from gum-pockets of lower anterior teeth affected by incipient pyorrhea alveolaris.	few
40	G. M.	Hard triturated tartar and soft material taken from the labial surface of the lower incisors.	absent
41	G. C.	Hard triturated tartar and pus taken from the labial surface of lower right central incisor, the root of which was free for about one-third of its length.	few
42	Id.	Soft material taken from the pulp canal of the upper right first bicuspid root, the crown of which was destroyed by the carious process.	absent
43	A. V.	Pus from a cutaneous fistula of the right submaxillary region.	absent
44	Id.	Soft debris taken from the root canal of the lower right second bicuspid, the crown of which was destroyed by the carious process, which was the cause of the cutaneous fistula.	absent
45	Id.	Hard triturated tartar taken from the labial surfaces of the upper anterior teeth.	absent
46	C. B.	Pus from a gum-pocket formed by pyorrhea alveolaris of the lower right central incisor, very loose and the alveolar tissue of which was almost entirely destroyed.	few
47	C. E.	<i>Materia alba</i> taken from the vestibular surface of a decayed tooth. Mouth with almost all the teeth decayed.	absent
48	Id.	Soft material and squeezed liquid from a piece of decalcified dentin.	absent
49	B. G.	<i>Materia alba</i> , teeth in bad hygienic condition.	many
50	O. R.	Pus from gum-pocket of pyorrhea alveolaris.	many
51	A. B.	<i>Materia alba</i> taken from the vestibular surfaces of teeth and from the space below the free gum margin; mouth with sound teeth.	absent

Number of order.	Initials of the names of patients from whom the material of observation was taken.	Material examined and conditions of the teeth and mouth from which it was gathered.	Result of the microscopical examination upon the research of the "Entamoeba buccalis."
52	A. A.	Soft debris of a deep carious cavity of the upper right first molar.	absent
53	C. G.	Yellowish hard tartar scraped from the crowns of the posterior right teeth, functionless.	absent
54	Id.	Yellow-orange deposit scraped from the upper anterior teeth.	few
55	E. M.	Pus from gum-pocket of pyorrhea alveolaris.	few
56	L. S.	Soft material taken below a gum polypus, which filled a carious cavity of the lower right first molar (in such cases the destruction of the dentin goes on very slowly)	many
57	R. P.	Hard triturated tartar taken from the upper right posterior teeth. functionless for mastication.	absent
58	P. V.	Pus from gum-pocket of pyorrhea alveolaris.	many
59	Id.	Pus from the same pyorrheic gum-pocket of the preceding case after some days of treatment with liquid medicines containing inorganic acid.	absent
60	L. M.	Purulent material taken from the subgingival space of an upper right cuspid transplanted about four years ago and now slightly loose from excessive attrition with the teeth of the inferior maxilla; mouth in bad hygienic condition.	few
61	G. F.	Pus taken from a very deep gum-pocket of a tooth affected with pyorrhea alveolaris.	few
62	A. C.	<i>Materia alba</i> taken from the interdental spaces of sound teeth which were kept clean.	absent
63	Id.	<i>Materia alba</i> taken from the same interdental spaces after having left the teeth uncleaned by the tooth brush for fifteen days.	few
64	I. C.	<i>Materia alba</i> gathered from the anterior teeth in bad hygienic condition.	absent
65	Id.	Soft debris from a carious cavity.	absent
66	B. G.	Pus from pyorrheic gum-pocket of the upper incisors; the pyorrhea alveolaris was serious and chronic.	many (encysted <i>Entamoeba</i>)
67	Id.	Hard triturated tartar taken from the anterior teeth and washed with running water.	absent
68	Id.	Pus from gum-pocket of pyorrhea alveolaris.	many (encysted <i>Entamoeba</i>)

For the sake of discussing the observed clinical cases and then coming to a conclusion, I think it is as well to resume the studied 68 cases in the following table:

RESUMED TABLE UPON THE FREQUENCY OF THE ENTAMOEBA BUCCALIS.

	Pus from gum-pocket of pyorrhea alveolaris.	Soft debris from carious cavities and squeezed liquid from soft decalcified dentine by the carious process.	Materia alba	Hard triturated tartar.	Yellowish-orange dental deposit.	Greenish dental deposit.	Gangrenous dental pulp.	Pus from cutaneous fistulas	Pus from alveolar sequestrum.	Totals.
Presence of Entamoebas...	21	5	7	..	2	1	36
Absence of Entamoebas...	1*	15	6	7	..	1	1	1	..	32
Totals	22	20	13	7	2	1	1	1	1	68

As observed in the preceding tables, I have not found *Entamoebas* in the *materia alba* taken from the interdental spaces of sound teeth kept hygienically clean by tooth-brush and dentifrices, while I found them in the *materia alba* gathered from the interdental spaces of the same cases, after the teeth had not been cleaned for some days for experimental purposes (cases 1-2; 62-63).

I never found *Entamoebas* in a mass of hard tartar except in cases 38 and 41, in which the hard tartar was mixed with pus from pyorrhea alveolaris; in cases 66, 67, 68, in which the *Entamoebas* were extremely abundant, they were absent in the hard tartar washed with running water.

Among the debris of carious cavities they were not found in fifteen cases out of twenty, while in some cases they were numerous in the *materia alba* taken from the surface of the teeth of the same mouth, but distant from carious cavities, as in cases 24-25; 32, 33, 34.

In cases 39-40 the dental caries was diffused almost in all the crowns of the teeth and the protozoon was not found in the *materia*

*Case under treatment with liquid medicines containing inorganic acid; in the pus of the same case examined before the beginning of the treatment the Entamoeba was present (cases 58-59).

alba, in spite of the mouth being kept in the worst hygienic condition. It seems then that the *Entamoeba* cannot live in an acid medium.

I have constantly found the *Entamoebas* in the purulent secretion of all the cases of pyorrhea alveolaris (21 cases). In a case of pyorrhea alveolaris, where they before were present, I did not find them any more after treatment with medicines containing inorganic acids (cases 58-59).

I have found *Entamoebas* in two cases of yellow-orange dental deposit, but they were not present in the greenish dental deposit.

While I did not find *Entamoebas* in gangrenous dental pulp and in the pus of a cutaneous fistula, I found them abundantly represented in the pus of a large alveolar sequestrum.

CONCLUSIONS.

I hope that my clinical observations will be confirmed by other and more numerous researches.

In the meanwhile my researches allow me to draw the following original conclusions:

I. The *Entamoeba buccalis* gets in a state of encystment in the oral cavity; therefore, it does not represent one of the stages of other *Entamoebas*, but it is a distinct form.

II. The *Entamoeba* is found in the pus of all cases of pyorrhea alveolaris.

III. It is generally present in the *materia alba* of the sound teeth if they are not kept in a good hygienic condition.

IV. It is not to be found in carious cavities if the destructive pathological process is present and consequently the medium is acid.

V. It is absent in the mass of hard dental tartar.

VI. The *Entamoeba* has not a pathogenic action; on the contrary, as it feeds on bacteria, it is most probably an aid to the auto-disinfection of the mouth.

EXPLANATION OF THE TABLE.

All the figures are represented by the same enlargement: microscope used Kiritska, Oc. 8 comp., Ob. 1/15 homogeneous immersion. The first seven figures are taken from microscopic preparations fixed with the liquid of Schaudinn and stained with ferric hematoxilin of Heidenhain; the last three preparations are stained with the mixture of Geimsa.

Fig. 1.

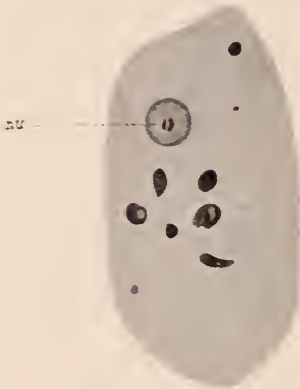


Fig. 2.

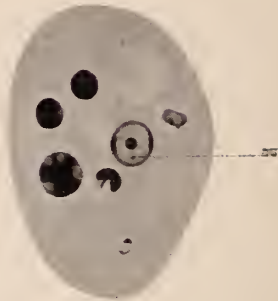


Fig. 3.



Fig. 4.



Fig. 5.



Fig. 7.



Fig. 6.



Fig. 9.



Fig. 8.



Fig. 10.



ENTAMOEBA BUCCALIS.

Fig. 1. Large oblong type of *Entamoeba buccalis*; *nu* = nucleus. The eight black masses have been ingested by the animal and are surrounded by nourishing vacuoles.

Fig. 2. Medium type of *Entamoeba buccalis* of almost round form; *nu* = nucleus. There can be seen also the black masses ingested by the animal and surrounded by nourishing vacuoles.

Fig. 3. Small type of *Entamoeba buccalis* without nourishing vacuoles.

Fig. 4. Very small type of *Entamoeba buccalis* with two nuclei

Fig. 5. Nucleus of *Entamoeba buccalis* isolated.

Fig. 6. *Entamoeba buccalis* in state of division. There can be seen the two cariosomi united by the spindle (*nu* = nucleus) and one incorporated black mass surrounded by nourishing vacuoles.

Fig. 7. Medium type without nourishing vacuoles.

Fig. 8. Small type with two nuclei (*nu* = nuclei).

Fig. 9. Type of *Entamoeba buccalis* in which is advanced the process of encystment. In the protoplasm there are a great number of bacteria ingested by the *Entamoeba*.

Fig. 10. Type in which the encystment process is less advanced than in the preceding case. At the left the external stratum of protoplasm is starting to form the membrane, while at the right side such formation has not yet begun. There are also in the protoplasm of this type a great number of ingested bacteria.

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SOME MEDICAL ASPECTS OF CERTAIN MOUTH INFECTIONS.*

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I feel highly honored that you should have selected me to discuss this vital subject. I am not here to tell you how to do your dentistry; I am here to tell you how much I appreciate

*Read before the Minnesota State Dental Association, August, 1914.

your opportunity. I feel strongly that dentistry is a branch of medicine. I say this with the full knowledge of the fact that during the earlier portion of my professional career such a statement would have been received with incredulity if not aversion on the part of both doctors and dentists. The times are changing. You are being patted on the back. Men like Osler call you "keepers of the gate." Dr. Mayo tells you of your importance. Hygienic congresses appeal to you. In general you are being welcomed to the fold. It may be idle speculation, yet it may be pertinent to wonder what would have been the result if the first efforts of dental teaching in this country had been fostered in a medical school. It was what your forebears wanted. It is a matter for regret to many if not all that Hayden and Harris 75 years ago were not allowed the experiment in Baltimore. It might have come about that the degree of dental surgery would have been snugly hidden in the old time degree of medicine just as our specialists in abdominal or cranial surgery are modest in their degree of M. D. The oral surgeon is as much a specialist in his field as is the laparotomist. They work, too, on one common subject. Why, therefore, should their basic training be so different? Yet they have been trained apart. Wrapt in the dream of its artisan perfection, dentistry has forgotten its noble origin and only too often it has attempted to supplant itself wholly in the soil of mechanical marvels. This is a strong indictment, but no stronger than the one against the parent stem. Proud and haughty with achievement, it let its lusty shoot grow in woeful negligence. The dentist and doctor must again come together. Their vision of their joint function must broaden. Truly, the day is past when the dentist can hide behind the whirl of his drill,, and the physician sit tight between doses of salicylates.

The far-reaching effect of mouth infections are as little understood by the average dentist as are these infections appreciated by the average doctor. It is idle speculation to estimate the incident of ill health due to faulty mouths. There are no real statistics. We only know that the percentage is very high. Yet with this glaring fact staring us in the face it is amazing how little the dentist acts as a guide to correct this systemic suffering and how little the doctor calls in the dental surgeon.

In regard to this juxtaposition of sleeping at the switch they are in the same predicament of the ducky who was learning to play on the cornet. At last exasperated by his efforts, he exclaimed, "I blows in so sweet and it comes out so rotten."

The statistics relating to disturbances of the blood, digestion and tonsillar, pharyngeal, bronchial, ocular, cardiac, renal, muscle, tendon and articular infections in which pyorrhea may act as a primary cause and root abscesses as secondary causes have not been collected. It is safe to say, however, that in nearly all cases of pyorrhea there are constitutional manifestations and that in pus pockets at the roots we are dealing with a secondary deposit of some systemic infection. The importance of these generalizations have led me to be persuaded to come before you.

On the other hand, one should not let these generalizations lead one into thinking that symptoms commonly associated with mouth infections may not exist in which the mouth has no relationship whatever. In clearing this confusion, in calling attention to the hysteria on the part of some of the dentists and doctors in this direction, I feel it a portion of my task. Again I have been much interested and instructed in looking over the dental literature of two years back by the able and intelligent discussions of this phase of your work. Members of my profession have also talked to you concerning this problem. I am unaware of its ever having been discussed before your state society prior to this evening.

In order to appreciate the systemic sequences of mouth infections, one must have a knowledge of immunity. Whenever an invasion of bacteria occurs, there is a local and general reaction. It matters little whether the site of the bacteria remains topical or systemic. In modern thought it is rare for any infection to remain localized. We are becoming more convinced that every topical infection is followed by a general invasion which may be spasmodic or constant. The mechanism called into play whenever an invasion occurs is called the immunizing mechanism. It has entity in our economy as much as the digestive or cardio-vascular systems. The reaction consists in the manufacture of antibodies, which neutralize, resist and kill

off' the invader. Upon the activity of this mechanism depends the results in every case. There may be three kinds of results: 1, complete immunity or restitution; 2, incomplete immunity or partial restitution; 3, no immunity or death. It is the forms of incomplete immunity with which the dentist and the doctor must combat. Pyorrhea and root abscesses are manifestations of infections in which partial restitution is the end result.

What can we do to bring these cases in the first class—a state of complete restitution? What have we been doing? For years we have been cutting down to and curretting abscesses, scraping root surfaces and in a certain percentage that was all that was necessary to obtain results. But in another large percentage such methods are mere temporizing with a condition much more subtle and far reaching than the mouth. In the first instances, by extracting a tooth, or scraping a pocket, you have not only let out pus but you have also pushed it in. You have inoculated your patient with a dose of vaccine; you have, in other words, performed an artificial auto-inoculation which in turn has given the immunizing mechanism the necessary jolt to produce enough antibodies to take care of the infection. Do not forget this fact. This doctrine of auto-inoculation. The mere extracting of a tooth, the scraping of a root surface has never alone produced restitution in the mouth. Clearing away infectious debris is necessary but the essential factor in healing is your immunizing mechanism. Nor do I wish you to forget that these two surgical manoeuvres likewise may produce the opposite results. They may start a metastatic process by means of this auto inoculation, in the heart, awake an old tonsilitis, inaugurate a blind abscess at the root of some devitalized tooth, light up a nephritis, awake pus in the prostate, and even cause the appendix to lift its head in painful protestation. I repeat, a tonsilitis, endocarditis, nephritis, arthritis, prostatitis or appendicitis, even gastric ulcer may have its inception in the dentist's chair. In other words, every time you work in your dental preserves you may affect the common freehold of the body. Every well trained dentist with a realization of this should have his internist make his freehold inventory for him. Just as every correct surgeon today cannot work without his internist, so, too, the converse is true. Every internist must have his oral

surgeon to clear up the dental links in the chain of cause and effect on the body freehold.

Another fact in immunity which I want to call your attention to is this. Every person after a certain number of years has attached to him some bacterium or bacteria which lives on him in a parasitic or semi-parasitic way, which by a process of repeated inroads on his health produces a chronic reduction of economic efficiency and may eventually garner him into the house of death.

This is another way of stating the problem of partial immunity. In the mouth this is beautifully illustrated by the pathology of pyorrhea and the blind root abscesses.

Another factor in the problem of immunity is that the organisms which commonly produce pyorrhea and root abscesses are of the kind which will not permit a permanent high level of resistance. If we could get an attack of pyorrhea which would permanently immunize us or desensitize us, just as it does occur in mumps, whooping cough or measles, such a result would be most desirable. But the facts read differently. This phase of the problem is of particular importance in estimating future procedures, the care of the mouth, the use of vaccines, the ultimate prognosis of a given case.

This brings us to the use of vaccines in dental infections. Much has been said for and against vaccines. I find the polemic in your literature. In ours it is gradually coming to a close with the judgment that vaccine therapy has a rightful place in medicine. The prejudice against vaccines is mostly due to ignorance with its train of suspicions, misdirected energies, and laziness. How often have I seen the purchase of vaccines over the drug store counters—its use followed occasionally by brilliant results and the cleverness of the vaccinator basking in the sunshine of his achievement. More often however have I seen the results absolutely negative with the sequential howl of disgust and condemnation. The use of vaccine absolutely demands accurate bacteriological diagnosis, accurate manufacture, if possible of autogenetic origin, on media as near to that of the tissues as can be made, a complete knowledge of the disease under treatment, and its laws of ebb and tide of immunity. Some time ago I was asked by a well known and learned dentist to make a culture from a pyorrhetic pocket. After cleansing the area with iodine, he reached for a curette, selecting one of many which ex-

tended from their respective holes in a block of wood—looking like so many lances in military order. “Is that instrument sterile doctor?” I enquired. “It was boiled last night before putting it away,” was the ready reply. Yet this man whose glaring lack of the fundamentals of bacteriological technique is here recounted, presumed to discuss the use of vaccines in pyorrhea before a national meeting of dentists. This instance of our benighted dentist is no more pitiful than that of the physician who alludes to vaccines as “serums” or who thinks he can destroy a local infection by means of antiseptics. Then too the trouble has been we have expected too much of vaccines. There is a common impression that they are to perform the miracle of Behring’s diphtheria antitoxins, whereas the humble immunizator has only hoped to imitate in part the natural processes which the body failed to do. I have been asked, “Should a dentist give vaccines?” Truly I cannot see how he can afford to do so. His function in relation to vaccine treatment to my mind, lies in surgical activities, aiding the bacteriologist in obtaining his material, aiding the process of immunity by clearing the ground for the repair of local parts. After this has been done he should place himself under the guidance of the immunizator, when and how much auto-inoculations is to be given from the local areas, in conjunction with the vaccine treatment.

The systemic effects of pyorrhea may be so slight as to be overlooked or they may be so severe that their cause may be lost sight of in the importance of their manifestations. In either instance the fact that pyorrhea is a systemic disease with the primary focus in the mouth must never be dismissed. I am aware that there are all grades of inflammatory conditions around the gum margins from the superficial ulcer to the deep extending sinus which if pus is present is called pyorrhea. We are dealing with an infectious process involving soft and hard parts of the area involved. It is a disease of middle age. The age when tissues are losing their tone, when the wear and tear of life is at its height, when the vicissitudes of bacterial invasion are expressing themselves, when some bacterium has already fixed itself on the economy and has adapted itself to the juices of the host. In short the period when the lethal scavengers are winning their first skirmishes.

The organisms found in pyorrhea pockets vary. The predominate number are of the streptococci group in which are included

the pneumococci. Other types are the staphylococci, the bacillus of Friedlander, and influenza, and occasionally the colon group and in many instances in smears are found the spirillum of Vincent. The bacteriological review is wholly in accord with the clinical facts. The streptococci if they do not destroy their host at an initial infection, become a persistent parasite with low grade virulence, flaring up at times but usually smoldering at various foci of the body, the point of interest to us just now being the alveolar pockets and margins. Depending on how much tissue is involved, what organism or organisms are present, how much constitutional symptoms are in evidence, our methods of treatment should vary.

The usual methods in vogue are local antiseptics and curetting pockets. Your case history may detail malaise, anemia, albuminuria, nephritis, joint pains, joint swellings, gastric or intestinal disorders, appendicitis, tonsilitis, pharyngitis. After your treatment your patient may experience additional awakening of symptoms in any of the localities enumerated. In a few days he will report himself better in general well being, and in the mouth. Did it ever occur to you that in your surgical procedures, you have auto-inoculated him with his infectious material, that you in reality have vaccinated him, that his immunizing mechanism, if it was on the job responded quickly and beautifully to the stimulation and thus the patient was improved. You did another important service by your surgical procedure. At the same time that you auto-inoculated him, you changed the hydraulics of the parts, you opened new sluice ways for fresh blood and serum and the antibodies contained in these fluids had an opportunity to do their work. It is this combination of events which causes healing in pyorrhea. Not the mere removal of debris. You repeat your local treatment several—many—times. The patient is dismissed. Is he permanently cured? Depending on the type of his infection and the distribution in the parts of the body he may or may not be permanently relieved. In many instances, particularly in the middle aged, and especially those of streptococcic origin, there is only temporary relief. Soon the train of symptoms combined with the local reappear. The tide of high immunity has ebbed. Either an old focus has awakened, or reinfection has occurred. The patient needs another course of stimulation.

I have retailed the picture usually prevalent, and recognized

by dentists a pyorrheic. In any given instance, the condition is one of the state of immunity of the patient as expressed locally in the extent of pathology which is present. In the type of case which is refractory, in which recurrences appear, is it not reasonable to call into play the artificial stimulation of the immunizing mechanism by means of vaccines? It has been my experience that judicious stimulation in cases of recurrent attacks of tonsilitis, pharyngitis, rhinitis, sinusitis, has made these attacks less virulent, far less frequent, and has put the patient on a plane of physiological activity which he was unable to maintain under the old order. I think this same line of treatment is indicated in the graver forms of pyorrhea. Intelligent use of vaccines can assist the local treatment by the induced high flow of antibodies. In using vaccines in conjunction with local treatment, the local treatment must be so arranged that it is given during the high tides of immunity. If ill timed, it may do more harm than good. When and how much of local treatment should be given, the type of lesion and experience can alone determine. There is this thought also. Is it not better to give this patient the benefit of future vaccine treatment in case there is the slightest indication, to avoid a relapse of local conditions, rather than to rely on auto-inoculation after the condition has again supervened? I leave the thought with you.

Where I so generously plead the cause of vaccines, I do so on the assumption that you mean to use a real vaccine, that some one will give the inoculations who has had experience. A vaccine to be of use, must have antigenic value, that is, it must be able to stimulate the production of antibodies, it must be given in proper dosage—which dosage must be spaced properly to induce the gradual rise to a high level of immunity. You see the pitfalls such a criterion entails. And yet my friends all of these items have been fulfilled many times, and the growing achievement of vaccine therapy is a matter of he who runs may read. There is another type of dental infection of which I am impelled to speak. It is the blind abscess, localized at the root end of devitalized teeth. Thanks to the aid of the X-ray this process of infection has given the student of vague and varied symptoms, a new hope in clearing up obscure conditions—and in rheumatoid states it is a veritable godsend to find these foci—from which we can obtain material for the study of causative agents and for therapeutic purposes.

Whereas every case of chronic rheumatism does not have root abscesses, nearly every instance of root abscess gives a rheumatoid history. These blind abscesses, sometimes they have broken through and appear as discharging sinuses, contain members of the streptococcic group. What we now know of the mutations of the streptococcus and its variation in virulence, asserting a selective action for different tissues, the devitalized tooth becomes a grave problem to the dentist. Every tip of a devitalized tooth whether the root canal has been properly or improperly filled becomes a *locus resistancei minorii*. I am inclined to generalize that prior to the days of devitalization of teeth, chronic rheumatic conditions were less frequent. Several generations ago, it was the custom to have a faulty mouth corrected by extracting teeth and substituting plates. Today every possible tooth is saved with the consequent penalty, in the large group who are sensitized to streptococcal invasion, of the possibility of these areas becoming store houses or foci for the streptococci, from which they spread out in periodic showers, in joints, muscles, periarticular tissues, to say nothing of the heart, appendix, kidney, prostate, and mucus membrane of the digestive tract. The X-ray has done medicine a wonderful service in detailing this focus to our attention. For often it is the only stand which has been overlooked and its removal closes the incident of future trouble. Again this focus may yield the material which keep the patient submerged in a subacute streptococcic invasion. It holds the balance of power. Its removal again gives the body its opportunity to close the chronic fight for complete sterilization. In advanced cases of systemic infection, this focus proves invaluable for obtaining growths for the manufacture of vaccines. It is accessible—reduction is necessary and thus at the same time two phases of the problem are dealt with. The incident of root abscesses, in chronic rheumatoid conditions is so high that no case should be passed by without a skiagraph of the mouth. The statistics are so high that I know of two dentists who are now treating rheumatism. Whatever the propriety of that may be, the fact must never be lost sight of that the root abscess in rheumatism is always a secondary focus, that is, it is haematogenous in origin and therefore primarily not a dental disease.

I merely call your attention to these facts. The work as yet done on the graver cases of rheumatoid disease is too recent to

draw any satisfactory conclusions. In those associated with the blind abscess, the focus invariably yields a streptococcus—usually the viridans or haemolyticus. The use of vaccines in this type of case is strongly indicated. I feel however, more strongly than ever, that here if anywhere, the exercise of judgment and experience, all the knowledge of the laws of immunization, and all the bacteriological acumen possible, are needed to bring about a satisfactory result.

These facts tell you how much I appreciate your opportunity. The chance to lead your patients to a higher plane of physical efficiency is most inviting. The field of dental infections is too broad for the dentist alone, and too specialized for the doctor alone. To bring this new knowledge to the common level of usefulness to all, there must be a broader intelligence upon the part of both physician and dentist, and the establishment of closer working relations between them, than now exists.

PRESIDENT'S ADDRESS.*

BY DR. G. B. DILLON, STERLING, ILL.

Just why one who is called upon to preside over a meeting of his Fraters is also expected to stand and deliver, is more than I can tell.

This is the custom, however, and to it I am indebted for the loss of sleep, and the frequent and vivid nightmares that have haunted what should have been my sleeping hours, since in the excitement of the closing hours of our meeting at Sterling last year, some one whispered in my ear "the returns seemed to indicate the election of"—your humble servant. However, these impressions soon began to fade, and before Christmas I had almost regained my normal condition, only to suffer a relapse while reading a letter from our genial and accomplished secretary, Dr. Bowers. The letter was innocent enough, and pertained to some matters relating to the society, but it ended with an admonition to get busy about that paper for the annual meeting, with a sort of "Do it now" emphasis that released all the little demons of my dreams to disturb me as before. But as the

*Read before the Northern Illinois Dental Society, Oct. 21, 1914.

program grew in size and importance, my particular part of it began to diminish until I could look with fortitude upon the task that once filled my sleeping hours with hideous apparitions.

The selection of a topic was the first question to be decided. It seemed wise to avoid a strictly scientific discussion or the discussion of a strictly scientific subject, lest I be unable to effect a landing, when ready to descend, or I might say, in case of accident.

I dared not attempt the humorous, for although under the direction of an expert, humor is highly contagious, under my deft manipulation it at once creates an immune zone of considerable dimensions. I know I can appreciate humor, but I seem unable to communicate my understanding of it to others, for if I attempt to be funny I am taken in deadly earnest; and when I am most intensely in earnest, my friends often seem to think me a joke. I have always stoutly maintained, however, that my friends were mistaken. But the thought of Elgin's beautiful buildings is not an inspiration to indulge in heated arguments.

Whatever difficulties I have encountered in beginning this paper, let me console you with the assurance that excellent terminal facilities have been provided.

I wish to thank each of you for your presence at this first session of our meeting, and to thank the members of the various committees for their loyal support. With one exception we were compelled to appoint new chairmen for these committees late in the year, owing to the resignation of those regularly elected.

Dr. Synder promptly took up the burden which was incompatible with the ideas of the former chairman of the Clinic Committee. Dr. McWethy, although Vice-President, and having served last year as chairman of this committee consented to again take charge of the program, and his work speaks for itself. Dr. Underwood deserves special mention for his good work and because he made no audible attempt to resign. I have already paid my compliments to Dr. Bowers.

There are many things beside "Technique" the germ theory, and the forcible separation of serumal deposits from a tenacious attachment to the pearly organs within the oral cavity.

Among them is the corrective force and power of mind, not

in opposition to skilled handicraft, but in command of it. There can be no question of the power of mind over matter, neither is it a question of belief, but of understanding. Once the Earth was believed to be flat, now we understand the truth and it no longer appears to be flat.

The marvelous understanding of Edison, of Marconi, and others which enables them when thousands of miles apart, to converse as if sitting face to face, are examples of mental achievements. Somebody has defined a Crank as one who is an expert on a subject that we know nothing about, and I will add if he makes it a financial success he becomes a Genius.

Are the Dentists of Illinois awake to the possibility of Mental Therapeutics? All use mental suggestion, but limit it to the effect on the imagination of the patient. A few month's ago a firm producing a filling material used by many dentists advertised extensively and asked the readers of the ad to demand the use of a particular filling by the dentist. This touched a tender spot in the field of ethics and a mighty protest has gone forth all over the country, and the point is well taken. The dentist must not allow his precious ethical garments to be soiled by the dust of a purely commercial corporation.

I believe this is largely a question for mental solution and when the mental activity of the great body of dentists is concentrated on the right solution it will be found, and opposition will vanish like the mist of the morning. Where we had expected to find the blackness and grime of strife we will be awakened and refreshed as by the sparkling dew of morning and a demonstration of our correct mental conception will have been witnessed.

Many of us attended the Fiftieth Annual Meeting of the Illinois State Dental Society, the greatest dental meeting in the world, and were filled with enthusiasm for our profession, renewing our vows of loyalty to the idea of a higher standard, and a constant personal effort to reach the summit of excellence as fore-shadowed by this great golden anniversary of organized dental efforts in this state.

Grand and inspiring as it was, an epoch in dental education and history, it could not take the place of the dear old Northern

Illinois Society, to many of us the friend and companion of our youth. The sensation at that Golden Jubilee was like one feels in a great art gallery—he hears the Babel of foreign tongues and with book in hand turns to the number and reads the history before he can understand the message in the gilded frame before him. *Here*, it is such a feeling as we have in the little old shaded house where the motto “God bless our home” hangs over the parlor door, and where you know the “welcome on the mat is intended for you.” Such a homelike welcome is extended to each of you. We have prepared the table, a feast awaits you, but no provisions have been made for sleeping—this is to be a wide awake meeting.

Every one should have an ambition toward which all his energies are directed, but between the present and the goal of that ambition will be found many way-stations worthy of consideration, and any one who in the journey of life can see only the end, who works and plans to enjoy only the final triumph, will not make the most of his opportunities for he will miss the great privilege of accepting from each day and each hour its share in the joy of living.

This is especially true of the practice of dentistry, for its highest rewards must be, not in the fee alone, but in the excellence of the work accomplished. Life is a grand excursion over the Scenic Route. He who is not willing to take in the beauty of the rugged mountain, and the modest flower by the roadside, who is impatient if sidetracked, who is disturbed by smoke or cinders, should choose some other route.

Dentistry has its rewards. It pays dividends but it offers no field for wildcating or exploiting. The books should be balanced every day and you must “count that day lost, whose low, descending sun, sees not by you some worthy action done.”

If this will satisfy the ambition, if one has contentment, and a desire to serve rather than to acquire, dentistry presents a field that has few equals. We must be progressive, we must keep up with the times. What is accepted as the best practice today may not be even tolerated next year. Filing teeth apart to prevent decay was once advocated by some very prominent teachers. Cataphoresis was once defended in this society and today we are explaining Analgesia.

Dr. Henry J. Allen (at the State Society Meeting in Chicago last March) speaking of the world's great achievements, said something like this, "Twenty years ago we had no airships, ten years ago we had no wireless telephone, and two years ago the Bull Moose was just an animal." These changes are brought about by a changed condition of thought, and without thought no advancement can be made.

A man passing through the mountains of a southern state met a boy going to mill, across the back of the horse he carried a long grain sack. In one end was half a bushel of corn and in the corner a stone of about equal weight. When asked why he did not divide the grain, putting half in each end and throw away the stone, the boy said he did not know—he never thought. Impossible! you say, no one could be so dense. And yet I saw thirty men and four horses work two hours trying to pull a large wire cable around a square cross arm on a telephone pole. Finally somebody thought—the kink was removed and the cable was drawn forward without further trouble.

"The 'Dago' digging in the street,
Sees time creep by on lagging feet,
He's working by the hour, you know,
And that's what makes the 'Dago' slow."

Mind is the great moving power of the world today. And I am only making these ridiculous statements to show that where the mental faculties are inert there is stagnation, the ultimate result of which is death. Not a house is built, not a wheel turns in all our great industrial plants until the action is first formulated in the controlling mind.

The steamboat, the air craft, the telephone, were each first constructed and operated in mind. Somebody knew the power of steam, somebody knew how to harness electricity, and the miracles of yesterday become the playthings of children today.

The formative action of mind is the starting point and every created thing, every physical manifestation, everything real and tangible, has its origin in mind.

"Back of the loaf is the snowy flour—
The snowy flour which the mill has wrought;
And back of the mill and the wheat and the shower,
And the sun, is the Father's thought."

The correct mental attitude is harmony, if we are out of harmony, we must correct our thought, and the result will be contentment, prosperity, love, peace, plenty—all we can rightly use. If we are out of harmony we have no defense against the evils of envy, hatred, jealousy, and all the string of passions that feed and grow upon our submission.

One of these evils is fear. What a pleasure it would be to do our work if there was no fear, and what is fear except a condition of mind? It has absolutely no relation to the facts in the case, but it does have a tendency to bring about the very condition feared. Medical authorities admit the fear of contagious disease is a large factor in bringing it upon people, and in many cases death is given as the direct result of fear.

Job said "the thing which I greatly feared is come upon me, and that which I was afraid of is come unto me," and if we may judge by the records in his case, he was indeed sore afraid. There is only one remedy for fear—a mind cure, if you please. Do you know of any other?

Anesthetics are of increasing importance to us, and are or should be, preceded by a mental effort to destroy fear. Analgesia is successful just in proportion as this is accomplished. Assistant Surgeon General Rucker, is quoted as saying "Afflictions of the appendix are due (to a small extent of course) to public concentration on this subject." Of cancer, he says, "if there is an increase, it is due to the increased attention given to the disease."

Prof. Elmer Gates gives some experiments showing the influence of mind upon the chemistry and tissue changes of the human system. He says "Accurate observation upon the arm when the thought of the owner was concentrated upon it revealed an increase in the blood circulation, and in the size, and a regular course of directed thinking for a certain time daily gave a permanent development of the limb. When a calm man breathed into a cold tube for five minutes the volatile constituents of the breath condensed into a colorless liquid. When the man was made angry, a brownish sediment appeared as the result of the changed mental condition. And in like manner the perspiration from the skin or exhalations from the lungs gave a gray sediment with sorrow, pink with remorse and so on.

Injectations of the brown sediment of anger produced nervous irritability in men and animals. Hate proved to be accompanied by a greater expenditure of energy than any other passion, and the chemical products precipitated, it was concluded, represent the most deadly poison known to science. The venom of hate as shown in the human countenance is so common that comment is unnecessary.

Another familiar example is the shedding of tears caused by mental action. Grief, sorrow and even joy—if the news of the death of a dear friend will cause the tear ducts to send forth great briny drops and the body to be convulsed with sobs, why may not another mental action cause increased flow of the secretions of the stomach and affect digestion?

The conscious awakening of love brings a blush to the maiden's cheek, fear will blanch the face of a coward, and why may not rightly directed mental action control the fear and pain of dental operations?

There is a chemical potency in mind which the dentist may bring to his assistance, not alone as a curative remedy, but in the larger relations of life. There is the sick business. He may be "enjoying?" one of those dull periods when the chair is not warmed with suitable frequency and regularity, when the good friends who have taken advantage of his weakness and opened a credit account refuse to come across, when he needs the money. If this is your case, shake off the mental lethargy, brush the cobwebs from your mind, and the corners of your office, brighten your surroundings, write pleasant reminders to your delinquent friends, invite them to come in without knocking, and talk it over, examine yourself and your work. Was the cavity prepared just as carefully for that amalgam filling as for one of gold, or for a porcelain inlay? Was that shell crown contoured, the interproximal space preserved, the adaptation to the root perfect? How about Mrs. Brown's plate, did you let her select the smallest, whitest teeth on the card, or did you select suitable ones for her? Possibly the plate rocked just the least bit, or you forget to ease it a little over that hard place. Of course they articulate in spots, at least, but are they effective in mastication? How do you determine the occlusal relations? By a strap hinge or a Gysi adaptable?

Answer these questions and others that will come, to your own satisfaction, and I assure you the light will shine, your hand will obey the impulse of your mind, and success and confidence will replace fear and depression.

Darkness is the absence of light and we grope about, not because darkness is any substance or thing in itself, but because of the absence of light.

Discord is the opposite of Harmony and all the inharmonious and destructive phantoms will vanish when we establish mental harmony. The clouds of doubt will be illuminated by the understanding of truth. Our lives will be brightened, our patients relieved and comforted, and the Earth blessed for our having lived.

It is our mental attitude toward others that governs, not their attitude toward us. Mind is a positive, aggressive, creative force, and stands not aside for any earthly power. Shall we claim and understand and use it? Shall we sit supinely by, accepting the servant's place? Or shall we demand the master's right?

"Ships sail East and ships sail West
On the very same winds that blow,
'Tis the set of the sail, and not the gale
That determines where they go."

MY EXPERIENCE WITH SYNTHETICS.*

BY DR. W. B. TYM, CHARLESTON, ILL.

When our program committee asked me to write a paper upon the subject of synthetic cement I readily assented, not so much for the reason that I felt especially familiar with the subject, but rather that by stating some of the methods I am using, I hoped to stimulate a discussion which will be a benefit to me and I trust of some help to others. I might add further that in using this silicate cement as a filling material I have tried to follow the suggestions of the manufacturers and others and make no especial claims of originality.

*Read before the Eastern Illinois Dental Society, October, 1914.

In this era of progression in our profession, we are called upon to restore teeth to their usefulness in such a manner that they are esthetically as well as mechanically right or as nearly so as is possible.

Styles, so to speak, in dentistry change much the same as in dress.

Some years ago a tidal wave passed over this country in which the demand for porcelain predominated. Some operators advised the removal of gold fillings and the insertion of porcelain inlays. You all know the difficulties encountered in the working of porcelain, the principal of which is the shadow problem, no matter how well matched is the porcelain inlay before setting the shadows of the cement change it entirely when viewed from the various angles. Then there is the ever present cement line and the extensive destruction of the tooth structure.

Along about 1904 the Ascher's enamel was brought out as a substitute for porcelain and the results from its use were varied. My experience was more varied than otherwise, although a few of the fillings inserted seven years ago are still giving good service, regardless of the discoloration. Ascher's enamel at that time was so difficult of manipulation and its action so varied, that few operators could tell with any degree of certainty what the results would be, and after I had time to see the condition of the greater portion of the enamel fillings I had made, I decided I was a novice in that particular line and relegated the remainder of my supply of Ascher's artificial enamel to the scrap pile. Since that time the manufacturers of this enamel have improved their product until the results, so I am told, are more gratifying, although I have never had the courage to investigate.

After finishing my labors with the above enamel, a porcelain furnace was purchased and my efforts were directed along the lines of porcelain art to a limited extent, as I felt that there were cases in which the use of gold was contraindicated. My experience with porcelain is about as was stated at the beginning of this essay, but porcelain seemed more esthetic than gold and predominated until about three years ago when the DeTrey's Synthetic porcelain was placed on the market and seemed to merit attention.

I might add here that my experience with Silicate cements is limited to the Ascher's artificial enamel and DeTrey's Synthetic porcelain although there are some other silicate cements on the market that are good.

With the DeTrey's Synthetic cement, (and by the way, I might add that I am told all silicate cements are synthetic,) I have had very gratifying results.

Silicate cements are manufactured of the natural silicates, aluminates, rare earths, feldspar and calcium; the rare earths have to do with the formation of the different colors and the calcium controls the setting. A definition for synthetic is a union of, or the combination of different elements.

In working silicate cements, I presume they are all practically the same as the synthetic porcelain; the weather conditions and humidity enter largely into the results. No silicate cement acts the same at all times and in all kinds of weather; they require only a certain amount of moisture and that moisture is supplied in the liquid which is composed of a small per cent of phosphoric acid, the remainder being a trade secret, though I presume a greater portion of it is water.

At the meeting of the Illinois State Dental Society at Peoria in 1913, Dr. Ames explained the theory of temperature, etc., to me though I am afraid I am unable to present it in as clear a manner as did he.

The temperature of the room should be about 70° F. this being the average of temperature for the greater part of the year and the humidity is correct or low. The temperature of the mixing slab should be about 60° F. At these temperatures the greater amount of powder can be incorporated into the liquid and the setting of the mix is proper. Should the temperature of the slab be much below 60° F., the setting will be too slow and should it be above 65° F. to any extent, the setting will be rapid and not enough powder can be used before the set, to make an ideal filling.

Then other factors than the temperature must be considered. We must consider the dew point. The dew point is established between 60° and 65° F., say about 62° F. In the warm months of the summer when the humidity is high and the temperature at 85° F. and above, care must be taken that the temperature

of the cement slab is at the proper degree. If it should be below 60° or many times even at 60° there will be a condensation or precipitation of moisture on the mixing surface which will interfere with the mix. The above is well illustrated by a glass of ice water, the glass being at a much lower temperature than the surrounding atmosphere, the moisture which is in the air is precipitated in drops of water upon the outer surface of the glass.

Dr. Ames suggested an apparatus composed of a dairy thermometer placed in a tightly corked bottle of water, the bottle having a flat surface to be used for mixing, the bottle and thermometer placed in an earthen vessel, such as a flower pot, filled with water. The evaporation of the water through the sides of the vessel will keep the water at about the temperature of 65° F., which at the warmer seasons is the proper temperature for mixing cements, the water in the bottle being of sufficient volume to maintain the temperature throughout the time required to mix and insert a filling.

I have never used an apparatus of this sort for mixing silicate cement for this reason: the water in my office is of about the temperature desired for this sort of work and by the use of the large glass cement slab immersed for a short time, the temperature is obtained and maintained throughout the operation. But for those who are not so situated, the method as suggested by Dr. Ames should be resorted to.

The results of the work I have done with synthetic are encouraging. The only fault with the material when discriminately used, if it may be called a fault, is that of wear from friction with approximating teeth. I see fillings that have been used for several years that are not detected until an instrument is passed over them, though upon close observation it will be noticed the contact point has slightly worn away, but the fillings have not been affected by the fluids of the mouth or the excursions of food over them.

I will now endeavor to discuss the method I use in cavity preparation, insertion, and finishing of silicate fillings and will try to illustrate them in the clinic which will be given tomorrow.

The preparation of cavities for synthetic is much the same as for porcelain inlays, inasmuch as there should be no beveled

margins. The margins should be as nearly as possible at right angle with the surface of the tooth, thus affording a greater bulk of material for edge strength, and while this material possesses some adhesive properties, they are not so reliable as are the oxyphosphate cements and retention form is advisable.

Some operators advise leaving the marginal line irregular, claiming that the presence of the filling is not so pronounced should the color be not exact. This suggestion no doubt has merit, but care should be taken in regard to the location and amount of unsupported enamel, for enamel not supported by dentin will not withstand any considerable amount of abuse.

The insertion of synthetic porcelain is an operation which must be carried out with no small amount of detail.

Your essayist always applies the rubber dam although some operators claim they are able to build and finish these fillings with the aid of cotton rolls; but I always feel more secure when the field of operation is desiccated.

In consideration of the patient, the preparation of the cavity may be finished before the dam is applied, although the conditions as presented should guide the operator in regard to this, for as you well know a dry cavity is less sensitive than a wet one, and it is sometimes advisable to have the cavity dry in order to tell when all carious dentin has been removed.

We are now ready to select the shade of powder or powders essential to deceptive fillings. This part of the procedure may be done either before or after the dam has been applied. Personally I prefer before, for then you have the tooth in its natural environment and with the shade guide direct from its container it is possible to select a more accurate shade of powder than if both tooth and guide are dry, although I have had very satisfactory results by the latter procedure.

After the desired shade has been selected, it is well to get all necessary instruments and materials ready so that there may be no delay after the mix has been made. This will include the coating of a celluloid strip with cocoa butter. The instruments necessary to good results in mixing synthetic porcelain are: a perfectly clean smooth glass mixing slab, preferably a thick heavy one. This slab should be chilled to about 60° to 65° F. and should the slab be of the larger size, it will approximately

retain this temperature throughout the time required to thoroughly mix the material for the filling which should not exceed one and one-half minutes. The spatula should be made of agate and the working ends oval in shape, thereby permitting of the rolling motion in removing mix from spatula. In mixing synthetic porcelain, do not grind the powder with the liquid, but dividing the powder into three or four equal portions draw each portion into liquid and gently stir and pat the mass until a reasonably stiff consistency has been obtained. A good test for the amount of powder to use is that as long as the material assumes a moist, glassy appearance upon being tapped with the spatula, the mix is good. A little experience will be needed to recognize these conditions and to be able to tell just when enough powder has been used, but by making a few trial mixes, one is soon able to obtain satisfactory results.

For introducing the material into the cavity, the manufacturers advocate the use of a Tantalum instrument, but ivory may be used with equal results, except with Tantalum instruments, they may be obtained in various sizes and shapes and are more convenient to use, but I have not as yet had a sufficient desire for that particular convenience to cause their purchase. When placing the material in the cavity, care should be taken to see that it is packed into the remote parts. About one-half the amount of material required to fill the cavity is first introduced after which the remaining portion is filled and the thin celluloid strip drawn over the entire mass and pressed close so as to condense and contour the filling. A slight tapping on the strip with an instrument will tend to distribute the moisture to the thinner and more condensed parts of the fillings especially the marginal portion. A difference in color is noticed when the moisture is expelled to an excess, that portion of the filling appearing lighter in color and of a chalky appearance.

After the strip has been drawn into position, it should be held there tightly for two or three minutes, after which it may be removed and the entire mass coated with cocoa butter and allowed to stand for about ten minutes, (although I usually allow more time) after which the filling may be finished down and polished. The polishing of these fillings cannot be very satisfactorily done at the same sitting they are inserted because

the material has not hardened to a sufficient degree to have the property of taking a high polish.

For finishing synthetic fillings, the manufacturers supply celluloid discs and strips which when coated with cocoa butter do very satisfactory work. I also use a small smooth stone for finishing the lingual surfaces, always having the stone well coated with cocoa butter. The polishing is done with fine cuttle paper discs and strips of fine grit, finally using the Carmi-lustre strips or tape which give a very good polish, although it is better to have the patient return for the latter part of the finishing.

The last step of the operation is to coat the filling with a moisture proof material. The manufacturers supply with each package of powder and liquid a stick of wax or a small bottle of varnish for this purpose. Personally I prefer the varnish as it is more easily applied to all surfaces. In case I have no varnish I use flexible collodion with equal results.

Care should be taken in removing the dam lest the varnish or wax be removed. If after removing the ligatures, you will clip the portion of the dam between the teeth above the filling, it may be removed with safety. Instruct the patient to remove the varnish after five or six hours, at which time the filling should have hardened to such an extent that there is no danger of it being effected by moisture.

PROFESSIONAL IDEALS IN RELATION TO FEES.*

BY DR. H. C. SEXTON, SHELBYVILLE, INDIANA.

For several years there has been a tendency among dentists and in dental literature to dwell more than has ever been done before upon the business side of practise. Everywhere we read articles and hear discussions upon dollars and cents and upon means and methods of getting more money from our patients. In fact we can scarcely attend a dental meeting anywhere that we do not hear some enthusiast eloquently advocating the raising of fees.

Now there may have been some good come from this tendency but along with this good has come a great deal of harm. The good you have already heard much of but the harm has

*Read before the Eastern Illinois Dental Society, Oct. 1914.

been unrecognized. Tonight I want to speak of the harm we are doing our whole profession. There is one tendency which all tendencies have in common and that is to develop counter tendencies. Tonight I want to develop a counter tendency.

You know man does not live by bread alone. The better part of any life, the better part of any profession, is not expressed in dollars and cents and cannot be expressed in dollars and cents. It is expressed in terms of professional duty and terms of professional service. In other words it is expressed in answer to the question: Are we as a profession doing all the good we can?

Are we doing all the good we can? Ah! that must make us pause and consider. My answer is: No, we are not. For some years we have been neglecting most seriously some of our greatest professional duties; utterly ignoring some of our most binding obligations. I want to recall to your mind those duties and those obligations.

What shall we say of the profession that suddenly has a great new responsibility pointed out to it, the responsibility of life or death to a degree that was never before thought of, yet that uses that new responsibility, that new duty, merely as an opportunity to make more money? I hesitate to apply a name. You know what I mean. Oral Hygiene, our new knowledge of oral hygiene, teaches the overpowering importance of care of the teeth. We know now that a bad mouth means incapacity, disease, sometimes death. We are instilling that knowledge into the masses, not twenty-five per cent of whom take care of their teeth as they should. Eighty per cent of the children in the public schools have carious teeth. We point out these terrible truths. We create a demand for popular priced dentistry. What have we done to supply this enormous demand? I'll tell you what we have done. We have raised our fees. We have done scarcely anything else. Let me ask you, do you think in the light of the above that we as a profession have done our whole duty?

The first consideration of any profession should be to do the greatest good it can to the greatest number of people. When it loses sight of that and puts all its endeavors into squeezing the most money out of its patients and putting that money into

its own pockets in the least possible time then it becomes, not a profession, but a mere association of—what shall I say? You may search your own minds for a term of opprobrium.

There may be those who think I have no right to criticise thus severely my own profession. But I am a part of my profession; if you take from me the right to criticise it then you also deprive me of the right to criticise myself which is most unwarranted. So then please regard this as a confession as well as a criticism. I thoroughly agree with that inspired poet who exclaimed:

“Things have come to a hell of a pass,
If a man can’t wollop his own jackass.”

Let me tell you of conditions in my own home town. Every man knows best the state of affairs in his own home and from that knowledge he judges the rest of the world.

In my home town we have over two thousand men working in furniture factories whose average wage is about eleven dollars a week. That is in prosperous days. For some months now they have had work not much over half their time. These men have wives and children to support. They must buy food and clothing and they must provide homes and fuel. How much do you think they have left from their wages after doing these things? How much have they left with which to pay dental bills for themselves and wives?

But let us not consider the adults. They have neglected their teeth most of their lives. We can’t reform them. Let their mouths go to ruin. There remain the children, eighty per cent of them more or less incapacitated by bad teeth. We lecture to them in schools telling them they must have their teeth cared for; their health, their development, their success in life depend upon it. An enormous new demand is created upon our profession. Our mission in life is to relieve suffering humanity, to save the health and lives of little children.

Tell me deep down in your hearts are we doing our duty in view of these facts when we meet chiefly to talk about raising our fees, to tell what we get for certain operations, and to complain that we do not get more? Ah! let us take the matter into our hearts. We have had it in our brains long enough.

Our brains are cold-blooded, selfish machines. Our brain has said: Make the present time an opportunity to crack up fees. We have stifled our hearts. It is time we listened to them awhile. It is time to come back to first principles. "Do unto others as ye would that others should do unto you." Therein lies the essential of all true professional ethics.

Some may think that the laboring men of our town are in an exceptionally poor plight but it is not so. The average wage of our town is as good as elsewhere otherwise our factories could not keep their employees. In the Indianapolis City Library a few weeks ago I asked for a reliable volume of statistics on wages and was referred to the Dictionary of Statistics published by Geo. Routledge & Sons. For 1911 that volume gives the average weekly wage paid by factories in the U. S. to men over sixteen years of age, as \$11.32. That is the average, mind you, and for every man who gets fifteen dollars a week another one must get only seven.

Now suppose that average hand instead of paying rent is buying a home for \$2,000 through the Building and Loan Association. If he borrows \$1,600 he must pay four dollars a week dues which leaves him \$7.32 to feed and clothe himself and family. Is anything left for dental work?

These men are not down and outers nor black sheep of any kind but good industrious American citizens. In our town a good percentage of them own their own homes. They would be insulted were they considered subjects of charity. What can the dental profession do for them and their families? That is our problem.

From a town such as I live in I go to dental associations and listen to talks from eloquent men who have practices among the wealthy in the cities and charge extravagant fees. They seem to think I am an unworthy member of my profession when I charge only one dollar for an amalgam filling. I listen to them with conflicting emotions. Am I really a disgrace to my profession? Are they after all right? Is there but one criterion worthy of consideration in this world—the criterion of dollars and cents? Is the biggest dentist merely the one who can charge the biggest fee?

One of these enthusiastic boosters of fees said last win-

ter: "I had a dentist say to me once that instead of trying to make his practice more expensive to his patients that he wished he had some method by which he could make it cheaper." The booster of fees then continued: "I looked at him in astonishment. I don't see how it is possible for a man to take a stand to lower his profession like that."

Now I differ from that booster. I have a great sympathy and admiration for the man who wanted to find some method by which he could reduce his fees instead of raising them. I see his reason and I honor him for it. Instead of lowering his profession he was to my mind exalting it. He had in his heart the professional ideal of service.

In an examination of children's teeth in the schools at home we dentists found several thousand first permanent molars decayed. In spite of our education of parents, teachers, and pupils I doubt if twenty per cent of them were ever filled. And the reason with most who did not have them filled was expense. I know I am guilty. I feel guilty. I have never had the heart to propose another examination of teeth in our schools. It is cruel. Those children should have had service. But at present our professional spirit of service seems to be decadent. We have given ourselves over entirely too much to the spirit of gain. I have heard many papers advocating the boosting of fees. I have yet to hear one that made a plea for suffering poor children—that we find some way of serving them. What has all this done for us? It has debased our work, tainted and thwarted our humanity, and degraded our professional ideals.

I want to call your attention to a very significant fact about a great many people who do not have dental work done. They will say it is fear of pain when really it is the expense that prevents them. It is a weakness of humanity not to want to acknowledge poverty. The average man or woman would much rather be considered a coward than be considered poor. That is one of the weaknesses of human pride.

There has been much loose talk flying around from the clamorers for higher fees. We have been told that machinists and bricklayers are much better off than dentists yet who ever heard of a dentist's quitting practice to become either a machinist or a bricklayer? All such talk is twaddle. We have

been told that ministers, physicians, and lawyers will average higher than dentists in their incomes. That is more twaddle. The average dentist's income is greater than the average income of any of the other professions. Dr. Clapp, the editor of the *Digest*, stated last winter when in Indianapolis that he never attended a dental society meeting in the East that the hat was not passed to help some poor, wornout, poverty-stricken dentist. Such talk I think wild and extravagant. I cannot speak for the East but I do know I have been attending our Indiana Association for many years and I do not know of one single case where the hat should have been passed or was passed for a pauper dentist. In fact I have never known a pauper dentist, never even heard of one.

All such irresponsible talk tends to make us dissatisfied with our calling in life and works us a positive injury. It makes us feel sorry for ourselves and that feeling is always pathological. It doesn't pay.

But I'll tell you what does pay. It pays to be glad you are living and it pays to feel that the profession to which you belong is one of the world's greatest benefactors and to be proud of it. The man who succeeds best as a dentist is the man who takes a joy in his work and a joy in the good that work is doing and does not spend his time grumbling that the world is not treating him right.

I have heard members of the grumblers' brigade talk like this:—"You cannot charge a patient too much for good dental work. It means comfort, health, even life itself. Can any fee be too big?"

Now that is a very silly argument. The grocer might just as well argue that he could not charge too much for his flour and potatoes since they meant life itself to his customers. But even if the argument were true in very fact, do you think it an honorable thing for professional men to put on the screws so tight that they extract the very last possible dollar from their patients? That is the principle the highwayman works on, but it doesn't seem a very high professional ideal, does it?

Some of the dental journals have gone so extensively into the advocacy of this thumb screw method of handling patients that little else is to be found in them. One in particular has so

distinguished itself that at first glance you might mistake it for a periodical for Jew pawnbrokers instead of for members of a liberal, advanced profession.

If a man's sole aim in this world is money getting then he should never become a dentist; if he is a dentist with that sole aim then the quicker he abandons his profession the greater chance will he have to accomplish his ambition. No one can become wealthy from the profits he accumulates in the practice of dentistry. To try to do so is only to butt your head against a stone wall. But a dentist by proper management can make a good living and can save enough money during his active life to keep him from want during his declining years. If he makes more than that then he must do it in outside investments or business.

There is another phase of this getting ahead in the world problem that the clamorers for higher fees invariably neglect. It is not what we earn that counts, but what we save. But saving takes self denial and many of us are too weak willed for that. It is so much easier to ascribe our poor commercial rating to having been poorly paid than it is to ascribe it to its proper cause—our weakness in will power, our inability to practice self denial. Poor weak man would always rather blame someone else than blame himself. In truth a dentist who is not self supporting and independent has no one to blame but himself. His failure is not from without; it is invariably from within.

On these points I speak from experience and therefore with authority. I have here given another big wollop to my own jackass.

Our profession has reason to be proud of the good we are doing to humanity, at least to the small part of it we serve, and I am sure that the first thought of all ethical dentists in planning restoration in a mouth is not, Which way can I make the most profit? but Which way is best for my patient? One of the chief arguments urged, however, for certain modern methods of practice is that they enable the dentist to charge "*a cracking big fee.*"

Now such motives are unworthy. When we listen to them we are departing from our higher ideals and lapsing to a plane that is beneath our better selves. Our first considerations should

be our professional obligations, our professional duties, our professional ideals. If we forget these then we become mere barbarians and vandals, in fact, quacks, no matter how high class a practice we may be running.

If a man, woman, or child is struck down with appendicitis there can always be found a good surgeon who will operate and save that life, no matter if the patient is not able to pay a dollar for the service. No surgeon worthy the name ever refused to operate in an important case because the patient had no money.

Nearly all physicians do some charity work, some of them a great deal. Very few dentists do any. No matter how worthy the person or child if he cannot pay a fee for the service then there is nothing for him but to do without the service. Yet today we know that bad conditions of mouths cost many lives, perhaps more lives than appendicitis costs. Should we not modify our attitude somewhat? Are we worthy the name of a liberal profession when we serve only the upper crust, the people who have money, who are in comfortable circumstances, and ignore poor people even the little innocent children? I do not say we should fill all teeth for impoverished people for nothing. I know we cannot do that. It is impossible. But our obligation is to try to help them in some way, to discover some method of serving them. So far we have only ignored them and raised our fees.

We cannot deny the fact that the improvements in the practice of dentistry during the last generation have all tended toward making dental work more expensive to our patients. This is all right for those who are prosperous but we should think of the poorer classes, the ones whom we are now educating in the care of the mouth. If we cannot supply the demand we create had we not better leave them in darkness? Is it not useless cruelty to educate them to the urgent need of dental work and then deny it to them on account of the expense?

It may be answered, we are establishing free clinics for the poor people. In one place in a thousand that is true. Grant you that in time we might establish them everywhere yet in my opinion it does not solve the problem. There is one thing the respectable working man will not tolerate—charity, and I honor him for it. He has pride, laudable pride. Charity is stultifying

to his manhood. Nine men out of ten who ask or accept charity are not worthy of it. Nine men out of ten who are worthy of it will neither ask for nor accept it under any circumstances. Emerson very truly says in one of his essays: "The worst thing about charity is that the men whose lives you are asked to save are not worth saving." No, I do not think charity will solve our problem.

We ridicule so called quacks for extracting teeth for twenty-five cents, for putting in fillings for fifty cents, and for making a rubber plate for five dollars; but I tell you many a poor man and many a poor man's family has had cause to bless the so called quack office. It has enabled him to have dental work done, it has made his children comfortable and healthy yet left him his self respect.

I am going to make a dogmatic statement here that I want you to remember. In all the long list of dental operations for saving or restoring teeth the one that is doing by far the most good to suffering humanity, and the one that is making by far the most money for dentists today is the one dollar amalgam filling. It is a blessing to mankind and a greater blessing to childhood. And if we could only discover a way by which we could put in a good filling in a first permanent molar for fifty cents we would double the amount of good we are doing and we would make more money ourselves. It will be done some day. Some day the masses will be served well and economically. We don't know all of dentistry yet. We are only children that have the biggest part of their growth to come. Some day there will be a dozen dentists to every physician.

The influence of economy on growth is shown vividly in the automobiles of today. Which does the most service to mankind the five hundred dollar Ford or the five thousand dollar Packard? Unquestionably the Ford, ten to one. Which makes the most money for its manufacturers? Again, the Ford, ten to one. A cheaper article that does just as good service always multiplies the demand and multiplies the good and just as surely multiplies the profit. Thus it is with the one dollar amalgam filling. It does more good than any other one operation we do; it makes us more money; and better than anything else, it broadens the field of service so that we can give health and comfort

to thousands and thousands who otherwise would have to lose their teeth.

It is a consideration of these things that makes me think that the one dollar amalgam dentist is not a disgrace to his profession. I think he honors it. I think he is doing about twenty-five times as much good in this world as is the dentist who spends his time putting in twenty-five dollar gold inlays or gold crowns. In these cases I would say the amount of good done is just about in inverse ratio to the fee each charges.

Now I am not just trying to throw mud at the twenty-five dollar man. Undoubtedly he has his place to fill. If I were in his place I might do just as he is doing. But he is a law only unto himself; he is no law for the rest of us and he must not try to make himself a law for us.

Some humorist has said that the Ford machine will take you anywhere on earth except into society. And that is true of the dollar amalgam filling. It will do good service to suffering humanity, produce comfort and happiness but if you want to get into upper crust dental society please, for goodness sake! keep quiet about your amalgam work. When amalgam is mentioned merely raise your eyebrows and look scornful. Then you will be taken for a dental aristocrat and all will go happy as a marriage bell.

Next to the amalgam filling the one improvement in dental practice that has been of the greatest benefit to mankind was the discovery of the vulcanization of rubber. That ensured plates for fifty people where one had before had the expensive gold plate. Yet today vulcanite work is looked down upon. Why? Because it is comparatively cheap. It is looked down upon for the very reason that makes it a great blessing to mankind. Isn't there a good deal of snobbishness about that?

Dental practice today is very complex. To make our service better we need to simplify. Complexity may bring beautiful results in an artistic sense but it takes us ever further and further away from our professional ideal of serving suffering humanity. To make our work serve mankind—all mankind—it must be simplified.

Here is something to think about. The greatest geniuses of the world and the greatest benefactors of the world are not those men who make things so expensive that only the rich can

afford them; but rather are they those men who have made things so cheap that all may share in their blessings. A man like Edison does not think it beneath him to put in years and years studying how to cheapen his product. Need we be ashamed of doing the same thing in our humanitarian effort to bring the blessings of dentistry into every home in the land? I think not. In fact I know not. Yet did you ever in your life hear a man in a dental association meeting take pains to tell you how you could do an operation cheaper for your poor patient? I confess I never did. Our efforts have all been to boost fees, to introduce expensive operations, and I for one think it is a record of which we as a profession should not be proud. If it were known just how many times dentists, influenced solely by the fee, have put on gold crowns or placed gold inlays where an amalgam filling would have done as well or better, we would hang our heads in shame.

The man who has brought the automobile down to the service of the citizen of ordinary means—Henry Ford—is today honored the world over. Yet he is not satisfied. All his efforts are still bent toward cheapening, cheapening, yet at the same time maintaining good service. I predict that some day a Ford will arise in dentistry, a great, big-hearted, brainy man who will solve the problem of dental work for the masses. We now bestow our services upon, let us say, twenty per cent of the people. This great man who will arise will show us how to serve the other eighty per cent or at least the bigger portion of them.

Today we are educating the lower masses of the people up to the great need of dental work yet we are denying it to them on account of the expense. We sadly need a prophet among us. But while we are waiting for our prophet we may each be able to do his little mite. Let us as a beginning then cut out all talk about low fees being inconsistent with high ideals in professionalism. High ideals and very low fees may be brothers and go hand in hand; and sad to say, the same with low ideals and high fees, they may be, and I fear often are, associated in a way that bode us as a profession no good. At the head of every page whereon any professional man places his charges against patients should be inscribed the motto: "Do unto others as ye would that others should do unto you."

OPERATIVE DENTISTRY AS TAUGHT BY G. V. BLACK.*

BY DR. W. R. CLACK, MASON CITY, IOWA.

It may seem superfluous for me to address the members of the Wisconsin State Dental Society on Operative Dentistry as taught by G. V. Black, for of the forty-eight states that make up our great nation there cannot be found four states in which the teachings of Dr. Black are as generally followed as in this, my native state and the three states that touch her southern and western boundaries. This quartet of states first adopted these principles and from them has gone out the leaven that has leavened the whole body.

But, if you will stand at my chair and see the operations made in human teeth by some of the men of these states and see the entire lack of design in the cavity preparations, you would not be surprised that I raise my voice protesting against the making of such operations, when, after all that has been taught, no man can honestly claim ignorance of better methods than those used by him in making the operations I speak of.

The object of most dental operations is the arresting of decay of the teeth and the restoration of their surfaces in such a way as will give the patients the maximum amount of service and comfort. Only to a few dentists is given the ability and opportunity to investigate into and talk learnedly on etiology and the pathology of caries. All honor to these investigators, but if we lesser ones stand idly waiting until the great and shining lights have all agreed as to the cause and prevention of initial caries, not alone in the land of the harem would the lower part of the ladies' faces be veiled.

To most of us it is sufficient to know that decay of the teeth is caused by faulty environment, and if we can make immune those surfaces of the teeth most susceptible to caries and give to our patients the use of those organs for more years of service, it is our duty so to do.

In order to do this, two things seem to stand out more prominently than all the rest. The margins of the cavity must be

*Read before the Wisconsin State Dental Society. July 1914.

so extended as to protect them from recurrent decay. This has been called "extension for prevention." And the filling must be so seated and retained as to resist dislodgment by the stress of occlusion, and this is known as the resistance or retentive form. Because of the failure of many men to differentiate between these two requirements,—presumably because both were taught by Dr. Black,—many have assumed that they were one and the same, which they are not.

This leads to the question,—what is extension for prevention? At a public clinic a patient was once assigned to me with the remark, "Here is a case that I want you to see in which extension for prevention did not prevent." I found an ideal gold filling in the disto-occlusal surface of an upper right first bicuspid. On inquiry I found that it had been made five years before. The hand of man could not have made a better operation. There was a cavity of the second class in the mesial surface of the same tooth. To this the objector pointed and said, "If extension for prevention prevents, why did it not prevent it in this case?" I answered that there were several things extension for prevention did not prevent; among them were in-growing toenails, and housemaid's knee.

As many do not seem to grasp the meaning of extension for prevention, Dr. Wedelstaedt, of St. Paul, suggested the use of the term "extension for immunity"; which has been approved and adopted by most of the leading men of the West and so we will use it here with your permission.

Extension for immunity means extension over the susceptible area surrounding that part of the tooth where decay has already started. It was never intended to convey the impression that such extension would immunize any other surface of the tooth, but I do believe that proper extension and the maintaining of normal interproximal space by the use of a correct contact point will do much to retard caries of the proximating surface of the adjacent tooth.

It may seem to you that the case I spoke of was one that came up many years ago, when the gentleman had had no opportunity to study extension for immunity, and that it could not occur in this age. But if you will go with me on a tour of many of the Eastern cities and visit the dentists who have not been attending the

sessions of the National Dental Association very regularly, you will be surprised to note that they have no definite idea today of what extension for immunity means. Even when the men from the West attempt to explain it to them, many will willfully misunderstand, misinterpret and misconstrue their remarks. If you will turn with me to the *Dental Cosmos* of May, 1913, page 470, and hear what Dr. A. D. Black says: "The beginning and progress of the carious processes may be easily observed clinically. Any one who will record examinations of a few hundred cases will observe that these carious processes begin on the surface of the enamel just gingivally of the contact point, between the contact point and the crest of the gum septum. They always begin at this position unless there are abnormal features present in the form, position or environment of the teeth. The progress of the growth of the colony of microorganisms on the surface of the enamel occurs in both directions buccally and lingually from the contact point involving a narrow band of the enamel just occlusally of the gum septum." He does not say that caries begins *at* the contact point but gingivally of the contact point, between the contact point and the crest of the gum septum. Can anything be more definitely and clearly stated?

Now turn with me to page 516, same volume, and see how Dr. Brigham misquotes him: "The essayist said that the cavity started *at* the contact point," which the essayist did not say. Again Dr. Brigham says, "If the cavity begins at the contact point, why shall we extend the cavity away out in order to carry out extension for prevention, if caries never occurred there? If in the cavity a tight and a properly contoured filling is inserted, why is that tooth not as perfect as it was in the beginning if caries never starts except at the contact point?" He misquotes Dr. Black and totally ignores the possibility of recurrence of decay at the margins left in contact with the proximating tooth and does not seem to realize that Dr. Black was speaking of primary decay. This quotation shows you that the opponents of extension for immunity are not always honest in their arguments against it.

Again Dr. Brigham asks, "Why the making of a small filling will not preserve the tooth?" when he has done nothing to correct the faulty environment that was the cause of the initial decay. Experience has shown us that if we operate in a field of faulty environment, and do not change that faulty environment, recur-

rence of decay will take place if the patient lives. Dr. Brigham ignores all this and assumes that by making a small operation in the center of the susceptible area he has overcome the faulty environment and that it is not necessary to extend the cavity to lines of immunity.

One reason why we extend the lines to the angles of the tooth is that no man ever saw a cavity begin on the surface of the enamel on the angle of a tooth, if conditions are normal. Now that may be considered an extreme statement and I will repeat it so that you may not misunderstand me. No man ever saw a cavity begin on the surface of the enamel on the angle of a tooth if conditions are normal. Now here is one much more extreme. Conditions being normal, caries beginning on the surface of a tooth in the usual place does not and cannot extend on the enamel of the tooth over the angles. The scouring given that surface by the excursions of the food and the action on the teeth of the tongue, to say nothing of the work of the tooth brush, will effectually prevent the growth of the colony of microorganisms on those angles. In order for enamel to become involved on those surfaces of the teeth, decay must penetrate the dentin and spread laterally, finally undermining the enamel from within outwardly, the same as it destroys enamel under healthy gum tissue.

Now we have found that caries begins on the surface of the teeth gingivally of the contact point and extends laterally nearly to the angles, never passing over them. We also know that in a very great majority of cases to remove the decay from and fill a pin head cavity in this place will result in recurrence of decay, if the patient lives, for the hand of man cannot make the enamel along the margin of that small filling any less susceptible than the hand of the Almighty made it in the first place. But if, by extending the margins of the cavity to the lines that decay does not cross, we can make that operation more permanent, are we justified in stopping short of that? But, when you have reached these lines of immunity, stop. Or, if you do not stop, do not lay such farther extension at the door of extension for immunity. Abnormal conditions may sometimes make necessary precautionary extension or extension for convenience, but, if you wish to be a truthful man, do not call it extension for immunity.

I have seen many preparations that the maker told me was

"after Black" where the proximal part of the cavity would be extended near the occlusal third, then narrowed at the beginning of where the gingival third should be and ended in a "U" shaped seat, leaving those very susceptible parts of the tooth—the lingo-gingival and bucco-gingival angles—exposed. Do not draw in your lines or curve them as you approach the gum; let your lingual and buccal margins disappear under the free margin of the gum in a straight line. *The placing of the lingual and buccal margins of the cavity on the angles of the teeth and the gingival margin under the free margin of the gum is extension for immunity and all there is to extension for immunity.* The man who insists otherwise only shows his ignorance of extension for immunity.

Here is another sort of argument put up by some men: *Dental Cosmos*, May 1913, page 513: "Dr. Black has said this evening that extension for immunity has nothing to do with the interior portions of the cavity." This is just the point that I want to make clear to you, for this party again says: "If the cavity is prepared according to the demands of extension for immunity, then the interior of the tooth has a great deal to do with extension for immunity." Now, is not that a profound argument? Yet as well founded as many others I have heard on the subject. It is a confounding of extension for immunity with preparation for resistance or retention. An erroneous idea prevails over many parts of the land regarding extension for immunity. There are several reasons for this. The Black men may be partly to blame. They may not have been definite enough in their statements as to the amount of cutting necessary, for so few men have studied the teeth for lines of immunity that when we say, "Cut to the lines of immunity," they fail to understand, because what is the line of immunity on one may not be on another one because of its different position in the arch and its changed relation to the other teeth. I would be glad to point out to you at the close of this session a guide that every person carries with him by which you can instantly determine the line of immunity.

Another reason is that many men who oppose the method have, either through ignorance or intent, misrepresented the principles of extension for immunity. If these misstatements were made only by the inconspicuous laymen, very little attention would be paid to them but when those who assume to be leaders and to speak

with authority give utterance to statements like these, they show an ignorance of the subject which is appalling and do injury to many who do not think for themselves.

One such, whose chief reason for bursting into print, seems to be that he is a native of Philadelphia and a graduate of one of its colleges, and his qualifications as an expert on extension for immunity is that he spent "Two golden hours" with Dr. Black. He says, "My acquaintance with Dr. Black consists of two golden hours spent with him in his laboratory last June. I called with a letter of introduction at four o'clock in the afternoon, intending to remain not more than thirty minutes, but my short call, proving so interesting, developed into a general discussion of everything dental, until I had spent two of the happiest hours of my life. And I a dyed-in-the-wool disciple of Flagg!"

Dr. Black is a mine of information, and has a very clear method of expressing his views, but I think "two golden hours" hardly sufficient to cover "everything dental" or the gentleman would hardly have given utterance to the following: "In closing permit me to express *my* opinion on extension for prevention. Its success, if any, has been derived from the ninety-and-nine that safely lay in the shelter of the fold—teeth that were never in danger; while the one lost sheep has never entered the realm of consideration."

"It is the poor, weak teeth that are extracted or crowned by the majority of dentists, because they do not have the means of salvation to offer unto them that demand our best efforts. To preserve all teeth, more especially a tooth that is about to be lost, should ever be our desire. To obtain such happy results, "Excavate to preserve!" Think of the care required in excavating, soft white carious portions. Frail cavity wall, rapid approach to the pulp, and nervous, restless patients are all to be considered.

"How different such conditions are from the yellow, gray, or dark carious portions found in teeth of medium, and good structure with fairly safe pulps, and in patients of highly resistive force! Also how different from the vary hard, carious areas found in teeth with very resistive pulps, and in patients with high power of resistance. The first mentioned condition tests the operator's skill to the fullest extent, and can be treated successfully only by the few, while the latter two classes present but few difficulties."

"How satisfactory when working on frail teeth to excavate to prevent. The former method insures to the operator the best results possible, while the latter means death to the tooth."

I have quoted the entire opinion of this opponent of extension for immunity to show you what stuff dreams are made of. He assumes to have learned all there is to extension for immunity in "two golden hours," and assumes to correct those who have sat at Dr. Black's feet for twenty years, and have had opportunity to try out the methods all these years. In all that article there is only one sentence that can be twisted into applying to extension for immunity. Why is it more desirable to save a broken down, lost stump of a tooth than one that would be more serviceable? He has missed the true mission of extension for immunity. Every tooth needs saving! Extension for immunity is a "first aid to the injured" and not a "recourse of the undertaker." It is the mission of extension for immunity to *save* the *ninety-and-nine*, and it does it.

The heroics he indulges in may bring tears to our eyes as we read, but do not apply to extension for immunity in the least. It would be like throwing a life preserver to a man after the coroner had given the verdict "Death by Drowning." Extension for immunity, if intelligently used, will prevent the condition he speaks of. It might be well for him to spend some more "golden hours" with Dr. Black.

Any tooth that by reason of faulty environment is attacked by caries, "Needs Saving" and is in danger, until that faulty environment has been changed to a condition of immunity. Extension for immunity is practiced almost exclusively on the proximal surfaces of teeth, and we believe it is better practice to render that surface immune to recurrence of caries than to temporize until the tooth is in the condition this gentleman so touchingly describes. A tooth intelligently operated upon while the cavity is of the first or second class will last more years and give better service than one that, as the result of repeated recurrences of decay, has to be *rescued from the grave*. Experience with the gnathodynamometer shows that such teeth are always "lame" and will not allow of heavy occlusion. Then why should we not make the first operation in such a manner as to make unnecessary this pathetic and tragic treatment? Is it because the operator lacks the skill and nerve to make one perma-

nent operation, or is there more money in the oft repeated operations?

So far we have not considered the inside preparation of the cavity or what we call the resistance or retentive form. Here the first thing to be considered is the amount and direction of stress that the filling may be called to withstand. Proper resistance form almost solves the problem of retention. So important do I consider a knowledge of stress and direction of occlusion, that I have had stickers printed, bearing the words "Look at the occlusion." Paste them on the box that holds your rubber dam. I well remember at a clinic years ago, where Dr. Wedelstaedt was censor, a man whose hair was neither as thin nor white as mine now is, being compelled to remove the dam, that the occlusion could be studied, because he had neglected to do so before adjusting it. If you were going to erect a house or build a bridge you would insist that the resistance or foundation form was perfectly flat, and at right angles to the direction of the stress that was to be applied.

Very few realize the amount of stress our fillings may be called upon to withstand. The gingival seat of an average filling in the distal surface of a lower second bicuspid, is about 2x5 millimeters. This may often be subjected to a stress of 225 pounds, some men being able to show 325 pounds on the gnathodynamometer. Two hundred and twenty-five pounds on a surface 2x5 millimeters means 14630 plus to the square inch, or 2,108,809 pounds to the square foot. A square inch of white oak crushes under a mean stress of 3,470 pounds, yellow pine 4,544 pounds, and brass at 10,300. Yet we expect our filling to—and they do—withstand a greater proportionate stress than oak, pine or brass. The seat must be flat or its equivalent. The architect who attempts to place a load of 2,108,809 pounds on a sidling foundation or seat, would be looked upon as a fool or a criminal. Now that you have decided to have the seat flat, how will you finish retention? Observation shows us that to depend on any system of pits, under cuts, or parallel grooves will lead to disaster. But here is the whole occlusal surface in which we may cast an anchor to windward that will not fail us when stress comes. But this is not extension for immunity, it is a purely mechanical proposition. I have never found it possible to get the same amount of retention by the use of pits, grooves or undercuts that I can by right-angles-anchorage

and I do not approach so near the pulp as by other methods; then, too, I am applying the resistance or the retention at the same place the stress is exerted. But this has nothing to do with extension for immunity, as I will show you. The principles work nicely together, but they are not inseparable, though the man who believes in one generally believes in the other, consequently practices both.

I will show you some plaster of Paris teeth with cavities in them, showing you that a certain surface of a tooth may be rendered immune to recurrent caries and still the inside cavity preparation be such that the filling would soon be dislodged by the stress of occlusion.

I show you another preparation from which it would be impossible to dislodge the filling by any reasonable stress and yet the filling would eventually fail from recurrent caries. I will also show you one that complies with extension for immunity, and also proper resistance form. Cut the lingual and buccal walls parallel to each other and at right angles to the axial wall. Then square out the seat or gingival wall at right angles to the axial wall, sometimes the curvature of the gingival line is so great that to make the seat or gingival wall flat would cut into the gingival line, or leave the lingo-gingival and bucco-gingival angles unprotected by gum tissue, so it is often better to convex that wall, which will, if you square out the angles perfectly give the same stability to the seat, as to have it entirely flat.

For anchorage cut a step in the occlusal surface, including in it all imperfections that may be found in that surface. Cut this with the surrounding walls parallel to each other and at right angles to the seat or pulpal wall; do not make this step deep, just through the enamel; bevel the entire cave-surface-angle, and slightly round the junction of the pulpal and axial walls and your cavity is complete.

I have given you some of these rules of procedure that are very familiar and no doubt are practiced by a very great majority of the men present. I have given them in the hope that some of those men who are still making the operations I spoke of in the first part of my paper—either through ignorance or because they are too lazy to make a better operation—may be spurred into doing their work with more care and with a higher regard for their profession and the good of their patients.

And finally, brethren, in view of the fact that we see too many of those inferior operations that have the appearance of having been made, not for the salvation of the teeth, but because the operator needed the money, would it not be well for each of us to take stock of himself, knowing that, if he has not already the knowledge of better methods of making operations, such knowledge is very easily obtained, and from this time on to make each succeeding operation better than the one that preceded it, instead of trying to pile up a little money with which to make a show at the expense of the teeth of our patients. Having in mind that old saying, "It were better to leave no footprints on the sands of time than to leave those pointing backward."

THE COOPERATION OF THE DENTAL AND ORAL
SURGEON WITH THE OPHTHALMOLOGIST AND
OTO-LARYNGOLOGIST, WITH SPECIAL REF-
ERENCE TO DIAGNOSIS.*

BY DR. JOSEPH C. BECK, CHICAGO, ILL.

It is nearly twelve years since I have had the pleasure of speaking before the dental profession of Chicago on a similar topic as I am doing tonight. I wish to express my sincere appreciation for having been invited to do so, and assure you that I am cognizant of the fact that I shall not be able to do the subject justice from the standpoint of the dental profession. I shall however be satisfied if I can arouse a discussion which will clear up many points which are of vital importance to the patient, the general public, the general medical profession, the various specialties with particular reference to the Ophthalmologist and Oto-Laryngologist. The dental profession has for a long time shown its independence apart from the medical profession, yet there can be no question of the intimate relationship of the dentist to the medical man. The wonderful strides that the dental specialty has made in the last ten years is so noticeable that the dentist that graduated before that time has to acquire many new phases of the subject if he wishes to be known as a modern dentist. Especially is it true in reference

*Read before the Odontological Society of Chicago, October 13. 1914.

to Oral Hygiene and Systemic infection from the teeth and alveoli. The public has been so thoroughly acquainted with this fact that not alone the well to do but also the poorer classes pay much more attention to their mouths and teeth, than they used to. The examinations of the teeth and mouths of School Children has had much to do with that and I believe that Dr. Frank Allport should receive a great deal of credit for the pioneer work he started by the compulsory examination of children's eyes, then nose, throats and ears, and finally the teeth. It is only one step further and that is thorough physical examination including all the important laboratory tests. Just imagine how many diseases will thus be prevented or stopped at their very onset and consider the value of such records for future reference.

I shall consider systematically and briefly the following points:

1. Orthodontia and the Rhinologist.
2. Diseases of the teeth and alveoli in relation to chronic focal infection.
3. Diseases of the teeth in relation to the nose and the nasal accessory sinuses.
4. Diseases of the teeth in relation to the eyes.
5. Diseases of the teeth in relation to the throat.
6. Diseases of the teeth in relation to the ear.
7. The neural side of the question.
8. The cleft palate and hare lip side of the question.

Orthodontia and Rhino-Laryngology:—Orthodontia has shown beyond the question of a doubt that the nasal chambers can be made much larger and nasal respiration much improved by the proper method of treatment and I believe that it would be universally applied if it was possible from the pecuniary point of view but the great majority of people requiring such work are not in a position to have it done. Another point that the Rhinologist is in doubt is: as to whether the rapid method, as suggested by G. V. I. Brown, or that of the slow method as recommended by Drs. Angle, formerly of St. Louis, Case, Noyes and others of Chicago, is the best. Again it has been found that very seldom when there was tonsillar and adenoid disease or a deviated septum, did the orthodontic work suffice.

2. *Dental and Alveolar Disease in Relation to Chronic Focal Infection*:—It is perhaps to Billings more than any other one man that dentists as well as laryngologists are indebted, for calling attention to the fact so emphatically that diseased teeth and alveoli can and do produce either a chronic toxemia with its entire train of symptoms or some distant point of infection, which he calls an embolic process. Per example, from one or more alveoli or teeth there will pass into the blood stream the microorganisms and lodge in the gall bladder and there produce a cholecystitis or into the stomach and cause an ulcer of the stomach, etc. This diseased condition may not be manifest in the teeth but can be shown by a radiogram of the roots which is imperative for a diagnosis. Now the reason the rhino-laryngologist is concerned is the fact that the tonsils or nasal accessory sinuses may also be the seat of chronic focal infection in the same individual and the removal of these foci may still not be followed by a complete cure of the patient. It is absolutely necessary to know that the teeth and alveoli must be examined before a patient is referred to a general man. I have had some of the most interesting cases along that line.

3. *The Disease of the Teeth in Relation to the Nose and Nasal Accessory Sinuses*:—The formation of fistulae of the alveoli into the nose are not at all uncommon and many such cases have been treated for a chronic purulent rhinitis or nasal catarrh and not until the diseased teeth are cured or removed did the nasal trouble cease.

Dentigerous cysts which may either encroach upon the nasal chambers or maxillary antrum are of sufficient frequency to warrant our consideration. The diagnosis aside from the physical examination is absolutely easy by a radiogram. Many of these cysts that I have had contained unerupted and undeveloped teeth. The majority of these had been treated by dentists, by the methods of irrigations or packing which can never cure a case since much more radical measures are necessary to obliterate them.

One of the most frequent conditions encountered in which a differential diagnosis is necessary is alveolar abscess of the superior maxillary in the antero-lateral region and acute antral

disease, and unless both the conditions coexist, which is not so rare, Roentgenogram will clear up the diagnosis.

Chronic suppurative sinus disease especially the antrum of Highmore is perhaps the closest border line between the dentist and laryngologist that exists and the accumulated literature on the subject is so voluminous that I shall avoid adding much to it at this time, but I wish to say that I believe the rhinologist very frequently overlooks the etiologic factor in the teeth. Conversely however, does the dentist overlook the frequency with which the other sinuses particularly the ethmoid, are secondarily involved and will continue to suppurate in spite of the removal of the disease of and about the teeth, causing the infection.

4. *Diseases of the Teeth in Relation to the Eyes*:—Aside from the already spoken of chronic focal infection causing infection by an embolus into any part of the eye, there is the affection of the eyes by direct continuity of structure and by the neural route. I have observed a recurring iritis in a patient that had these attacks once or twice a year for fifteen years, had seen some of the best internists and ophthalmologists in the country, had an iridectomy performed, I removed his tonsils, his antrum was explored, but all with not much success, and not until his teeth were put in first class condition did this recurrent iritis stop. Many cases of so called idiopathic choroiditis are undoubtedly of dental origin. Secondary involvement of the eye from the tooth by way of the antrum is quite common and such a condition as orbital cellulitis and retrobulbar infection has been frequently recorded from infected antra, secondary to diseased teeth. Without very much evidence of inflammation the patient can quite rapidly lose his eyesight by affecting the optic nerve by such secondary infection or pressure. In regard to the neural aspect of the eye affection from the teeth by way of the fifth nerve, which I will consider in connection with the neural side of the subject, suffice it to say now that pain in the eyes and about them as well as refractory errors due to spasm of the ciliary muscle, is not at all uncommon due to diseased teeth.

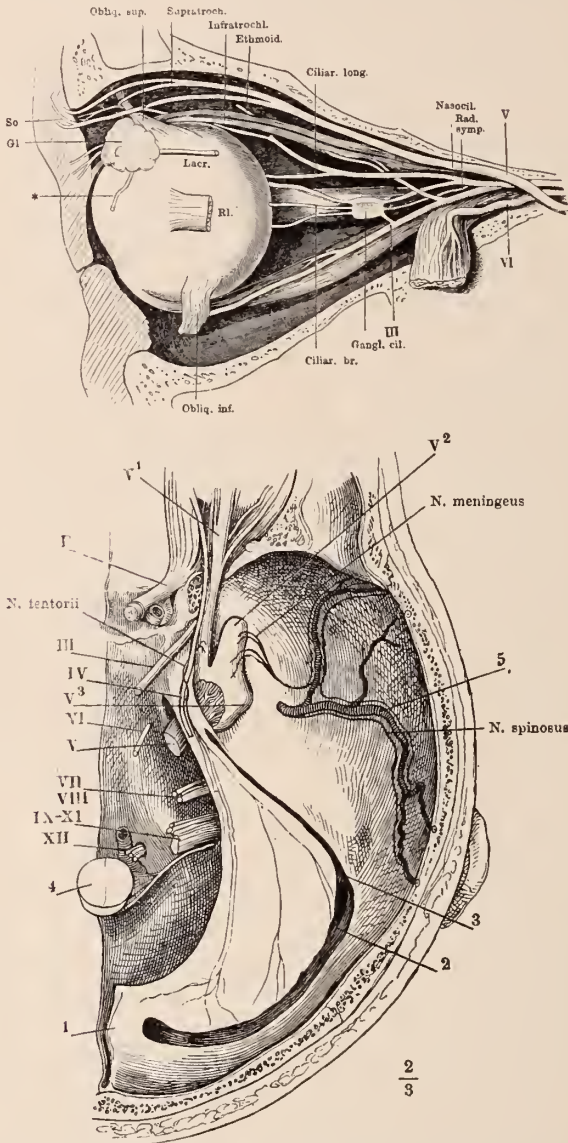
5. *Relation of the Diseases of the Teeth to the Throat*:—A frequent observation that I have made and one not very often cited in the literature is the unilateral pharyngitis, laryngitis, and

tonsillitis and even peritonsillar abscess, from an infection about a molar tooth. These recurrent attacks do absolutely stop when such teeth are put in proper condition. The already mentioned fact in relation to chronic focal infection in determining whether the tonsils, the teeth or both were responsible is one of the most important subjects of the day to consider. At the present time when the tonsils are blamed for everything, as rheumatism, etc., and when they are removed and the trouble still continues, but when diseased teeth are placed in good condition the trouble ceases, one will at once notice the importance of this subject. This is not at all rare. I am of the firm belief that many times the pharynx and tonsils are secondarily infected from the teeth, especially in cases of the pyorrhea alveolaris, and that a cycle occurs, namely, that the chronic toxemia from such diseased tonsils perpetuate the pyorrhea.

6. *Relation of the Diseases of the Teeth to the Ear*:—There are perhaps very few instances of a direct involvement of the ear from the teeth by continuity of structure but from the chronic toxemia or embolism from the chronic focus of infection is by no means rare. The circulation between the teeth and the ears is intimately associated and by this means do we have many symptoms from the ear produced. So have I observed a persistent ringing in the ear clear up when the disease of the teeth was corrected. As to the referred pain from the teeth to the ear, and vice versa it is too common to have to be reiterated, but I will speak of it in connection with the neural side of the question.

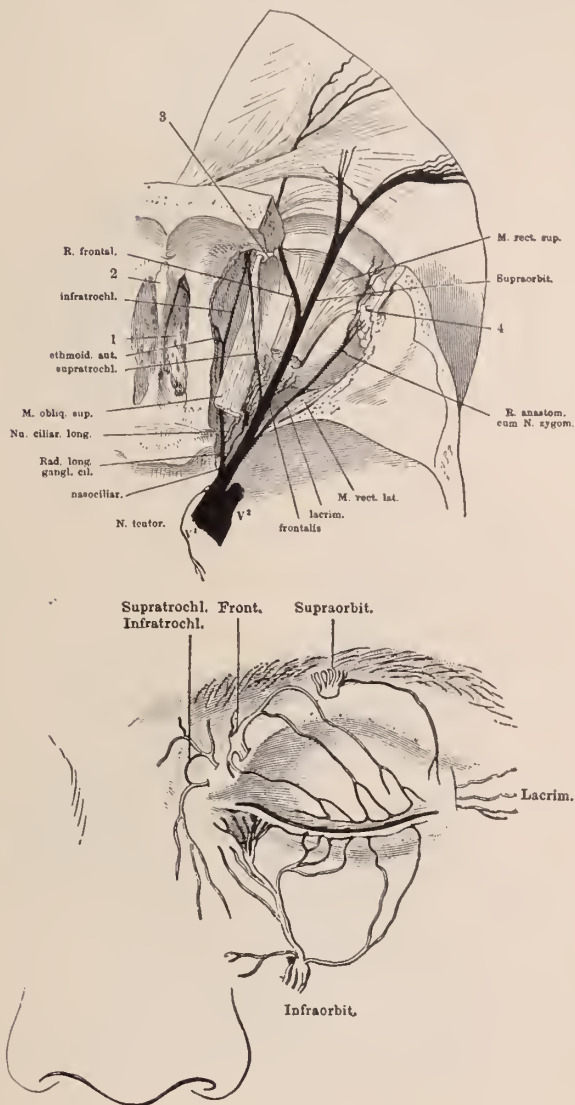
7. *The Neural Side of the Question or Referred Pain*. There is not another subject in medicine, that is as important to every doctor to know and know well, as the anatomy, physiology, pathology, symptoms, prognosis, complications and treatment of the fifth pair of cranial nerves, from their deep origin to the final terminal filaments and association with other nerves particularly the sympathetic. I repeat the sympathetic. There is also perhaps no more wide spread affection than this one, often spoken of as neuralgia, which usually runs a very persistent chronic course. If however, the diagnosis can be made as to the primary point of irritation and that point can be attacked and removed. then the chances of permanent recovery are good. Once how-

ever, the process spreads to various branches and the condition of true neuralgia is established, then the prognosis as to



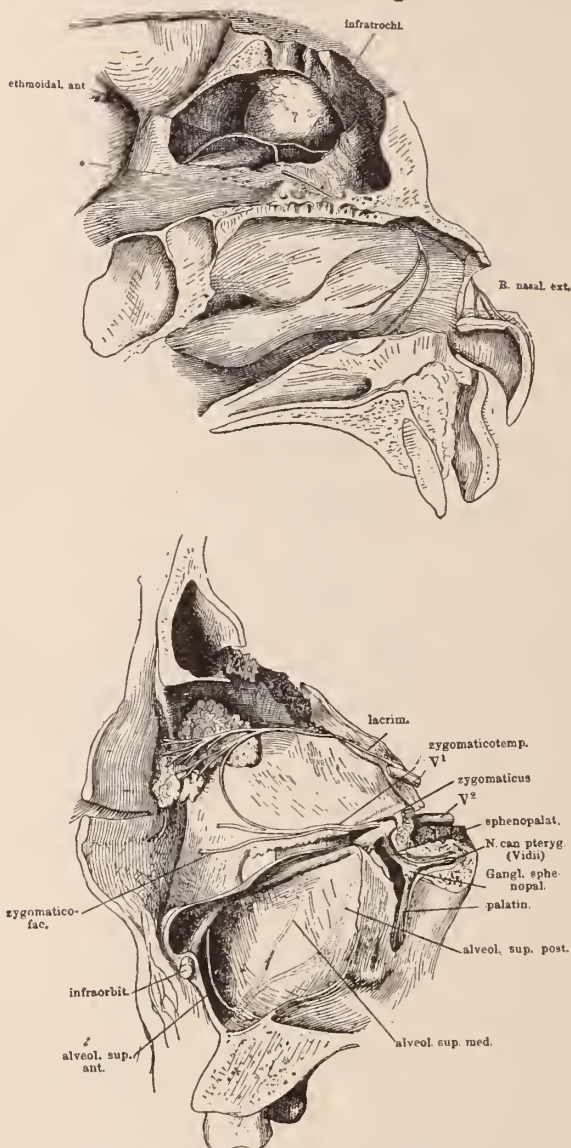
recovery is not very good. It must be borne in mind that the pain may be referred from the Gasserian ganglion peripherally

as well as from the terminal filament to the ganglion and any portions of the nerve in between. One of the best illustrations



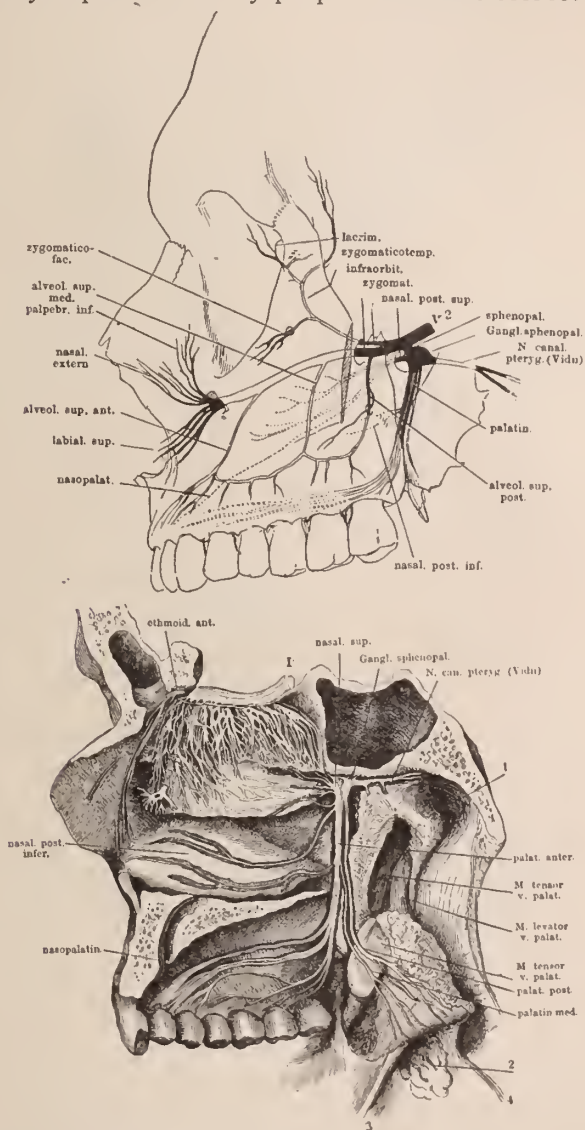
is the ear pain from the irritation of a tooth and the toothache from the irritation of the middle or external ear; the path is

the same in both instances. One of the most important points, in regard to this subject is the knowledge of the various gang-



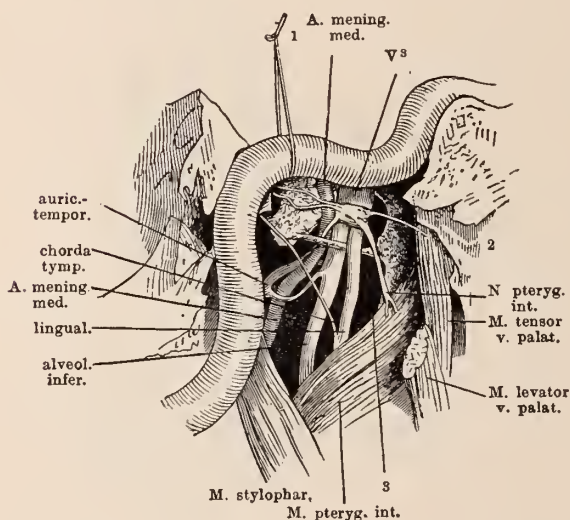
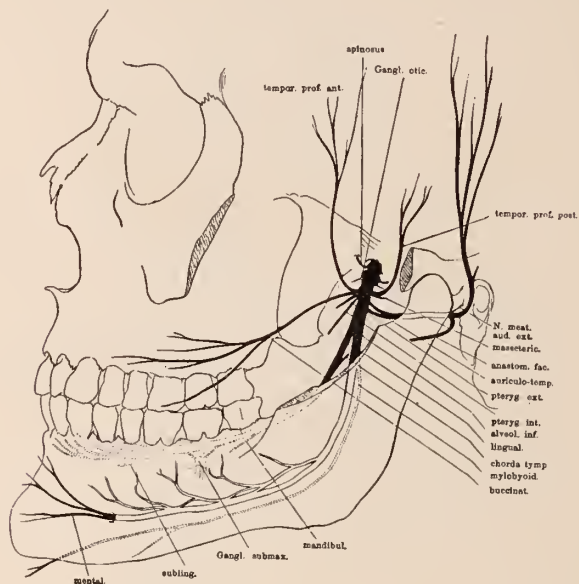
lia in the course of the fifth nerve owing their association and distribution of the other nerves as the pneumogastric, glosso-

pharyngeal, etc., and the great group of sympathetic nerves. Through these the most complex of symptomatology can be scientifically explained and by proper treatment corrected. This



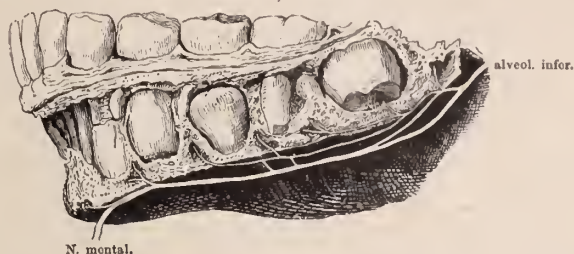
portion of the study is to me the most interesting of all, and I am sorry that I cannot go into detailed discussion since that

would take up too much of your valuable time. It is true however, that the teeth are very frequently the original seat of the

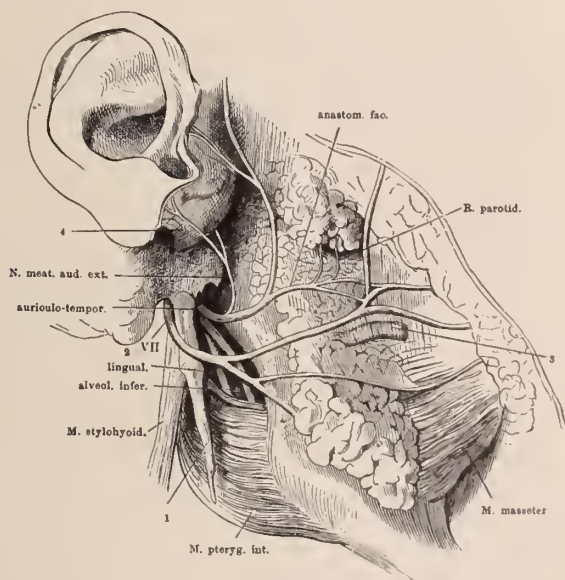


trouble and yet the patient may, before he has come to the dentist, have consulted and been treated by the ophthalmologist,

oto-laryngologist, neurologist, internist or general surgeon, as well as all the possible now recognized fads and cults. There are however many cases that have come under my observation,



which consulted the dentist by my reference and he would declare the condition not due to the teeth. I then would treat the patient, and many times it was some operation within the nose or throat. The patient would not be benefited by my



treatment and I would send him back to the dentist, who in turn would examine and many times with very uncomplimentary remarks about me, saying "There is nothing the matter with the teeth." All this time the dentist's examination has been limited

to the ordinary physical examination of the teeth and not looking beyond by means of a radiogram. I feel that this is the vital point of my subject and wish that conditions were otherwise.

Figs. 1 to 12 illustrate the distribution and association of the fifth nerve and show the organs that may be affected.

8. *Cleft Palate and Hare Lip and Its Management by Oral Surgeons, Oto-Rhinologists and Laryngologists.* It is my belief that good team work has to be practiced in such cases between the oral surgeon and rhinologist and laryngologist because the functions of the nose and throat are often neglected when just the lip and palate are corrected. The speech defects are not the least part of the work to be considered. I wish also to call attention to the malformed jaws that I have seen as a result of the Brophy operation, not performed by Brophy, however, and often wonder if the gentlemen have ever seen or even read carefully of the Brophy operation.

PROCEEDINGS OF SOCIETIES.

NORTHERN ILLINOIS DENTAL SOCIETY.

MEETING AT ELGIN, OCTOBER 21, 22, 1914.

DISCUSSION OF THE PRESIDENT'S ADDRESS.

DR. JAMES W. CORMANY:

We have here a paper so very different from the usual kind and touching on those things, I believe, so fully, that a reason can be assigned by our president why he selected me to discuss it. As to being dictated to as to what material we shall use for the stopping of certain cavities that has been done before. I remember distinctly a patient returning to me after several years' absence from home. She told me she wanted her teeth filled with "gold platine." That was surely the stuff, but it is unnecessary for me to tell you that it was among the poorest make of alloys at that time. We will not stand for dictation, but we will stand for consultation and teaching. Our patients are better educated now than formerly, and it is our duty to consult with them and teach them the better way.

I do not like the word "knuckle" to the demands of the few; and who are these few? They are *we, us*, if you please, who are meeting here at this time, doing a favor to the stay-at-homes, doing

a favor to them. They are not knuckling down to the few. They are spongers. They await eagerly to know what new and easy method in dentistry we have brought out, and when some deserving dentist sees fit to patent his process, and the law gives him the right so to do, a great howl goes up because he does not give it to these spongers free of charge.

Yes, we are the mind that sways the world, and will continue to sway it with our good deeds of charity, our words of encouragement, and our helpful hints.

"Mind is a positive, aggressive, creative force."

Let's see. The good book tells us, "As a man thinketh in his heart, so is he," so if mind is what the essayist says it is and what the good book tells us it is, then let us clarify our thoughts. Let us hold the mental picture of success at all times. "Oh," says my friend, "how are you going to do that?" I'll tell you—by affirmation. I am health, strength, happiness, prosperity, everything that goes to make for good—these are the mental pictures you are to hold. Let me illustrate: We wish for certain things. The desire for certain things indicates that the things exist, and that we possess the ability to obtain them, so do not dictate how these desirable things are to be had. The thought held that you have them will bring them in due time.

MINNESOTA STATE DENTAL ASSOCIATION.

DISCUSSION OF DR. ULRICH'S PAPER.

DR. JAY N. PIKE, Minneapolis, Minnesota:

There is much in this paper of Dr. Ulrich's that helps us to stop and consider a number of problems vital to dentistry.

From the birth of our profession it has not been led peaceably along a path of progress made easy for it. It has been driven to work out its salvation in its own way, and in many ways has benefited much thereby.

Today its ideal is near of accomplishment, following out knowledge and based upon knowledge gained during its long years of isolation as a profession.

Dr. Ulrich deplores the fact that we ever separated from the parent stem, nevertheless I feel that our sum total of knowledge is

greater for the same reason. I feel that it would have been a calamity to dentistry if Drs. Hayden and Harris had been successful in their endeavor. The D. D. S. degree might not only have been hidden in the old time degree of medicine, but it might have been buried there. However, these things are only idle speculation; the facts are that we are both here.

It has remained for the X-ray to demonstrate to medicine that there was some real pathology mixed in with our much despised teeth, and for bacteriology to demonstrate the relation of things, until today the two professions realize that they are indispensable to one another.

Dr. Ulrich early in his paper remarks that it is not his purpose to tell us how to do our dentistry. However, knowing Dr. Ulrich's work as I do, and having so much faith in his scientific grasp of this problem, I feel that this paper of Dr. Ulrich's marks an epoch in dentistry, and that we do need some one to tell us how to do some of our dentistry. If he is correct in his views, we are about to have such an upheaval in our ranks as will revolutionize dentistry. In his paper he makes the statement that abscesses at the roots of teeth are haemotogenous in origin and as such are not of dental origin. This upsets all our traditional teaching. He has maintained for several years that the infection of the apical space in devitalized teeth, no matter how they became devitalized, was not by way of the pulp canals, but was secondary always to a general lack of resistance to the invading organism. In other words, that the pathogenic organisms in the abscess came by way of the blood stream; that it was always an organism that was already attached to the patient as a parasite. This in part explains why some patients have joint infections who have abscesses at the roots of the teeth and why others do not. It simply means that in order that a patient have joint infections secondary to foci about teeth that he must be sufficiently sensitized to the streptococcus which has invaded the area of lowered resistance about the tooth apex.

This brings us face to face with a tremendous problem to us as dentists. It shows us that no matter how perfect our technique in filling root canals, we have this area of lowered resistance always about the root apex. It shows us that any patient who is highly sensitized to the streptococcus cannot afford to possess devitalized teeth. As we know that any of us at any time may become highly

sensitized to the streptococcus, it can lead us to but one conclusion, and this conclusion is of momentous importance. It simply means that the time has arrived when we must cease to devitalize teeth and must extract instead, and clean our patients' mouths of all devitalized teeth as well, unless we are willing to take great chances. It means that Dr. Hunter was right when he assailed dentistry. To those who are convinced and are ready to take the step, it means tearing down all our bridge work and all structures placed upon devitalized abutments, or assume a grave responsibility in not doing so. To take this step may require more courage than we possess, but taking it will pave the way for a similar radical treatment in many pyorrhea cases. The mass of evidence on all sides of us will drive us to cease temporizing. When the public awakes we will find that they value their health too much to carry these volcanoes in their mouths. We must rise to the test before our general surgeons begin to extract teeth in cleaning up the links of the internist's chain.

Whether such radical measures as just advocated will meet with acceptance or not will depend upon the proving or disproving of the hypothesis that apical abscesses are of haemotogenous origin, and if proven we who have been taught to "extend for prevention" will have a new slogan, and it will be extract for prevention; also, it will not be an unmixed evil to us as dentists. We will realize, as will our patients, that we must do just as our medical brothers were forced to do in dealing with tuberculosis, by beginning earlier in the game. When patients realize that an exposed pulp means extraction, they won't wait so long. We will learn that we can best conserve the pulp by conserving the enamel. We will not waste our energies trying to patch up incurable conditions. We will start by giving our children clean, healthy mouths. We will then have adults with normal mouths and teeth instead of repaired wrecks. We will see the dawn of our new era—Preventive Dentistry.

DR. F. B. KREMER:

While not scheduled to respond to our guest's essay, I have been too intimately associated with him in this field of activity to allow the occasion to pass without adding to his remarks some conclusions of my own which have been arrived at as a result of observation and experience in a large number of cases, the majority of which have been of a nature to prove the correctness of the theory advanced by him.

Gentlemen, this has been a hard pill for me to swallow, but now that it is down I feel better, and its beneficent influence is being shared by those of my patients who have been victims of ill-advised dental service.

It is no light matter, after thirty years of hard work, to suddenly awake to a realization of the fact that we have been deceived and that our fundamental doctrines have been founded upon error.

When Dr. Ulrich first presented his ideas to me I scoffed at them, and rather broadly intimated that his cranial contents were lacking in that degree of solidity which we recognize as necessary to clear thinking and proper understanding. I even went so far as to make a drawing showing a sectional view of a tooth, and proved conclusively (to myself) that root abscesses were the result of improper surgery, and not, as he contends, of blood origin, and, therefore, secondary lesions.

Within forty-eight hours, a case presented in my office, showing arthritis deformans, and giving a history so clear that none could have erred in establishing the relation between teeth and joints, and a chronology that proved beyond a reasonable doubt the existence of a septic blood stream caused by an impacted and infected lower third molar.

In this case every devitalized tooth carried a blind abscess, and yet all of the roots were filled in a manner to prove the greatest care on the part of the operator.

I have arrived at the conclusion that our theories of the origin of root abscesses are wrong, and that the essayist has given us our first scientific knowledge of this condition.

Believing as I do, in the new doctrine of the causation of alveolar dental abscesses, it necessarily follows that I must cease the devitalization of dental pulps, or else do that which I am convinced is radically wrong in principle and a menace to the physical welfare of my patient.

So thoroughly am I convinced of the inadequacy of pulp devitalization and of root filling as a proper therapeutic measure, that I am going to violate tradition and make a prophecy for you. I believe that this meeting in Duluth will mark a new era in dentistry, and that in later years the profession will point to this paper of Dr. Ulrich's as the beginning of rational thought and practice in this field. I further predict for you, that in twenty-five years that

man who wantonly destroys pulps of teeth will be held to as strict an accountability by the law as is the medical practitioner at the present time who fails to observe common, ordinary prudence in his treatment of the case.

Gentlemen, you all know me, and have known me for many years, and I think you will give me credit for being conservative, and I want to say to you that time and experience will prove to you that I am not deviating in any way from my ordinary methods of thought or action, in stating to you the position that I have enunciated this evening.

I know what your present thought with reference to my remarks must necessarily be, but I am content to await your verdict, knowing that when you have gone into this matter carefully, thoughtfully and thoroughly, that you must arrive at the same conclusion that I have, and take the same position that I do.

DR. ELMER S. BEST, Minneapolis.

I wish to compliment the Essayist upon the presentation of a paper which represents so much scientific research. I know him to be a man who has an abundance of excellent ideas and one who will make any sacrifice to prove or disprove a step in the building up and substantiating of a scientific theory. If we had more men of his calibre and inclination, Medicine and Dentistry would be greatly benefited.

Do not forget his remark, "I am here to tell you how I appreciate your opportunity." Do we all appreciate the significance of this idea? Dentistry as a profession never had such a chance. Its members have never had presented to them such an opportunity to really do something for suffering humanity. They also have never had such a chance to prevent suffering in their patients.

The Essayist has brought to your attention the inestimable value of the X-Ray for diagnostic purposes. I want to emphasize what he has said and add that not only is it a valuable aid but it is essential, in fact entirely necessary in certain forms of our work. Root canal operations which have been done in the past, when examined with the X-Ray, make us feel as the darkey did in the Essayist's story, in playing his cornet, "I blows in so sweet and it come out so rotten."

As to the cause of apical abscesses, I must take issue with

the Essayist, when he says that the quality of the pulp canal operation has no bearing on the after results. I am firmly of the belief that these abscesses are formed, as a result of improper pulp canal operations. This you will admit is quite possible when the operation is done under the circumstances as we so frequently see it. I will not at this time state my opinion regarding the exact etiology of the formation of these abscesses.

I admit that at present it is very hard to present convincing figures to show that good pulp canal operations prevent absolutely, abscess formation. We do not have to prove that poor pulp canal operations are conducive to these formations, "We admit it." Now before we commence a wholesale extraction, we must prove that perfect operations will prevent them.

The more extensively I go into this work however, the more convinced I am that two years ago when Dr. Pike suggested the teaching of Prophylaxis to school children instead of filling cavities, he was very near the truth.

AMERICAN DENTAL SOCIETY OF EUROPE.

FORTY-FIRST ANNUAL MEETING HELD AT THE HOTEL CONTINENTAL,
PARIS, JULY 30-AUGUST 1, 1914.

DISCUSSION OF THE PRESIDENT'S ADDRESS.

DR. H. W. C. BÖDECKER:

Said he did not want to discuss the paper, but there was one point on which he wished to say a few words. The position of the American Dental Society of Europe was unique. No society in the world stood on its own feet in the way this society did, all other societies having national societies to back them up; and when trouble occurred it was always the national societies who were there to protect their interests. The incident mentioned by the president, namely, that some of the members of the American Dental Society had not been treated as recognized professional brethren, was an important matter. The society had no body that they could officially appeal to, and the National Committee of the National Dental Association of America had stepped in and endeavored to protect them. They were not compelled to do so, but they did so simply

from a feeling of justice, and he believed the society ought to express to the National Dental Association its thanks for the action they had taken. He therefore proposed: "We, the American Dental Society of Europe, in regular session, wish to express our sympathy with the action taken on behalf of those of our members who are affected by the unfortunate ruling of the Local Committee of the International Dental Congress in regard to their admission as members, and to thank the National Association for their action."

DR. O. SOLBRIG seconded the motion, which was carried.

DISCUSSION OF THE PAPER BY DR. CHIAVARO ON THE ENTAMOEBA
BUCCALIS.

DR. E. C. KIRK:

Said he would hardly have the temerity to speak upon the subject were it not for the fact that just before he left America he was called up on the telephone by Prof. Allen J. Smith, the Professor of Pathology and Topical Diseases in the Medical School of the University of Pennsylvania, who said: "If I treat seventeen cases of pyorrhea alveolaris with medicine, and nothing else but medicine, and sixteen of those cases get well, what would you say about it?" He replied, "I should say that it was a miracle." "Well," he said, "come over and see me; I want to talk about it." He went to see Dr. Smith and found that one of the assistants in the Department of Histology in the Dental School, Dr. M. T. Barrett, had gone over to the pathological laboratory in the Medical School and asked to be given a piece of pathological work to do. Dr. Smith suggested to him to take up the subject of pyorrhea, but Dr. Barrett demurred, as he considered the subject had been investigated from all sides, and the more it was investigated the less was known of it. However, he said he had been looking over the exudate from a number of pyorrhea cases and had found some interesting protozoa that it might be worth while examining. In the seventeen cases examined he found the presence of the entamoeba buccalis. In view of the constant occurrence of the protozoa, Professor Smith suggested it might be worth while to test in a therapeutic way the action of ipecacuanha, because of its known lethal action upon the amoeba which was the cause of dysentery, and to their surprise they found that after a few applications the inflammatory activity in the cases of pyorrhea subsided. They had some cases of pyorrhea associated with glandular enlargement of the neck and considered

that possibly the glandular difficulty might be a metastatic inflammation due to infection from the pyorrhea exudate, and in those cases the glandular enlargements subsided. He went over the exudates with Dr. Barrett and Professor Smith, and saw the amoeba, both living and stained, and found them as described by Professor Chiavaro. He did not wish to convert the discussion into one on pyorrhea alveolaris, but it was significant that the applications in those cases had given such wonderful therapeutic results. Whether pyorrhea was in any way associated with the pathogenic activity of the entamoeba buccalis was, of course, an open question, because, as Professor Chiavaro had shown, the phagocytic action of the protozoa might have a very important usefulness in auto-disinfection of the mouth. Moreover, studies of the action of hematin in the treatment of dysentery showed definitely that ipecacuanha, although it had an action on the amoeba coli, was not a specific. When he arrived in Europe he went to Burrough and Welcome's and procured a supply of hematin hydrochlorid and wrote to Dr. Prinz, asking him to have it tried in Berlin, and several men in England and Germany had been using it with uniformly favorable reports. He did not mean to imply that the amoeba was the specific exciter of pyorrhea infection, but he presented the fact that the use of hematin had, without any other treatment, produced prompt and efficient results in pyorrhea. The work which Professor Chiavaro had done enabled the subject to be taken up intelligently and earnestly. In every case of pyorrhea the protozoa had been demonstrated to be present. Even the exception Dr. Chiavaro put forward was one in which the protozoa was eliminated temporarily by the use of an inorganic acid medium. Another interesting fact from the clinical point of view was that in carious cavities in which there was an acid action the protozoa did not exist.

DR. C. F. BÖDECKER:

Congratulated Professor Chiavaro on the great amount of work he had done. The pathogenic action of the entamoeba buccalis was interesting in that it did not flourish in an acid medium. If it was found to have no connection with pyorrhea it was possibly because the mouth was not disinfected thoroughly. In nature there were many birds that removed insects, and it might be there was a similar thing going on in the mouth.

DR. MENDEL JOSEPH

Said that when Dr. Chiavaro showed him his studies on the subject his first idea was that, although it was naturally very interesting for any one to know the different inhabitants of the mouth, it was hardly of practical interest to the dentist, and it seemed really a question for the laboratory. The work had been beautifully carried out from all points of view and Dr. Chiavaro had brought forward real facts gained by study. That was important, because very often men tried to form conclusions that extended beyond the facts they had studied. He was glad now to learn from Dr. Kirk that matter was of considerable importance, not only from the biological point of view, but from the practical point of view; in fact, he had been told that Dr. Kirk considered the amoeba as a specific organism in pyorrhea, and that assumption should lead to a very careful study of the *entamoeba buccalis*. The absence of caries might be explained by the alkaline condition of the mouth, that alkaline condition being just the condition for the development of the *entamoeba*. He thought Dr. Kirk's communication was of very great importance.

DR. KIRK

Wished to emphasize his point of view that he did not regard it proven that hematin was a specific for pyorrhea alveolaris or a specific for the destruction of the *entamoeba buccalis*. It had been shown very definitely by researches upon dysentery that hematin was not often a specific there, that it was destructive of other bacterial forms as well. He was not sure that pyorrhea was a specific disease.

DR. A. PIPERNO

Asked Professor Chiavaro if he had made researches on the edentulous mouths of old people or in the mouths of young children; also whether he had studied the *entamoeba buccalis* in conjunction with other bacteria in the mouth; also whether he made the studies in the mouth day by day or left the mouth clean for a time and then continued the study; also did he endeavor to make a culture in the laboratory by bringing the *entamoeba* from one mouth to another mouth where *entamoeba* were not found.

DR. VALADIER

Said that several weeks ago he had received a paper from Phila-

delphia giving him the results of Dr. Barrett's work and he immediately called up his collaborators at the Institute and started to make investigations on the same lines. Finding that hematin was a drug with which Dr. Barrett had been working, they immediately studied hematin to its full extent and found it was rather a dangerous drug. No instruction being given as to how it was to be used, it was tried on a monkey in which pyorrhea had been developed. The hematin was applied to the gums at 4 o'clock in the evening and the monkey was dead at 9 o'clock next morning.

DR. PRINZ

Said hematin could be procured in tabloid form in the necessary quantities, one-third of a grain, from Burroughs, Welcome & Co. The tabloids were dissolved in distilled water, one in two cubic centimetres of water giving a 1 per cent solution. That solution was applied by means of a blunt hypodermic syringe, sufficient to fill the pocket. The pus was first pressed out, the pocket filled and covered with vaseline or some other material to prevent the hematin flowing out. The patient was left undisturbed for two days and then the treatment repeated. With regard to the poisonous nature of hematin, the question whether the monkey died from hematin was not very clear. As a matter of fact, as much as half a grain could be injected into the tissues and had been so injected in tens of thousands of cases in the Philippine Islands with perfect success; he had not heard of a single death. It should be remembered that hematin was an alkaloid of ipecac, and if a patient accidentally swallowed some of it he might feel inclined to retire for a short time. Hematin produced emesis when given through the mouth and therefore had no action. Where hematin had been tried in Berlin it had been remarkably successful. The treatment should be repeated every other day for three or four days. He had spoken with a man who had spent a great deal of time on the bacteria of the mouth and had been told that for ten years he had not been able to show such a thing as an entamoeba, but as a matter of fact he had not looked for it.

DR. CHIAVARO

In reply, said he did not look into edentulous cases because there was no place where material for study could be found except in the saliva. Neither had he dealt with the mouths of young children. It was difficult to make cultures of the entamoeba because

if they were not kept at the proper temperature they died. He extended his sincere thanks to those who had taken part in the discussion.

ODONTOLOGICAL SOCIETY OF CHICAGO.

A regular meeting was held October 13, 1914, with the President, DR. L. L. DAVIS, in the Chair.

Dr. Joseph C. Beck read a paper by invitation entitled "The Co-operation of the Dental and Oral Surgeon with the Ophthalmologist and Oto-Laryngologist, with Special Reference to Diagnosis."

In connection with his paper Dr. Beck exhibited a patient and said: This patient came to me with a persistent nose bleed, with a small ulcer on the septum. I tried to stop it in the usual way, but was unable to do so. I made a careful systematic examination and could find nothing the matter. I found afterwards that she had a few enlarged glands in the neck, and I thought this enlargement might be due to the tonsils. I removed the tonsils, and still the glands became very much enlarged. I sent her to a dentist, who examined her mouth and said there was nothing the matter with her mouth or teeth. I operated on her by resecting the septum, which will cure most cases of bleeding that will not stop otherwise. Even this failed to stop the bleeding, and then I reopened the flaps of this submucous resection and cauterized with the actual cautery. Still not being able to stop the bleeding, I was very much perplexed about the case. I again told her to go back to her dentist and be examined, as I suspected some trouble with her teeth. She went, he examined her, and made this remark to her, "What you need is a good nose doctor, and not a dentist." I was very much put out about that statement. I found the probable cause of the trouble in her mouth. I had Dr. Porges take off the crown of the tooth suspected and found it loose and black as coal. It came away without any effort, and underneath it there was found a sequestrum of one-quarter of an inch in size. I operated on the patient and found the sequestrum and necrosis spread along the alveolar process to the septum, and the nose bleed was unquestionably kept up by the superior maxilla necrosis with a pulpless tooth which the cap held between a neighboring healthy tooth.

I felt very bad about the remark the first dentist made, and I think it was carelessness or indifference on his part that he did not make a more thorough examination. The bleeding has now stopped and the patient is getting along very well.

DR. THOMAS L. GILMER:

The divorce of dentistry from medicine some eighty years ago caused a wonderful stimulus in the development of the mechanical side of dentistry, but, at the same time, it lessened the development of the dentist in anatomy, physiology, chemistry, pathology, and other medical subjects. For the past twenty years dentistry has been constantly adding to its general medical knowledge. This, together with the constant growing interdependence of medicine and dentistry, will in time, I believe, be the means of bringing dentistry back into the medical fold. As years pass and as dentists see and hear more of the important matters so well discussed by the essayist, they will recognize the desirability of a more thorough medical training.

The criticism of Knapp, of New York, many years ago, was a serious arraignment of the dental profession. Hunter's criticism of dentistry more recently was an eye-opener to most dentists. These criticisms were not pleasing, but they have been helpful, since they have made us think.

The study of focal infections by Billings and others in their relation to joint, heart and other lesions, was a wonderful stimulus to dentists, since it caused them to study infections of the mouth more closely, and more careful work is resulting.

Our relation to the ophthalmologist, rhinologist, laryngologist and otologist is close, but it is also close to the internist. Few dentists in Chicago pass many days without seeing in consultation patients sent to them by physicians, asking an examination of the mouths of these patients to discover if there may not be found in the oral cavity cause for a lesion in some other part of the body.

The essayist spoke of orthodontia in relation to his work. The widening of the jaws is doubtless helpful in some cases. The mechanical widening of the jaws has brought about good results, principally by the stimulation of latent forces in nature to activity, which results in better development.

I do not see how the dentist can get along without the use of radiograms. The findings permitted by the X-ray have caused me

to lose confidence in myself and brother practitioners relative to the treatment and filling of root canals of teeth. We all know that there are root canals which cannot be properly disinfected and filled to the apex, for the simple reason that all roots are not uniform in shape and size. Some canals are so small and tortuous that it is impossible to open them up to their apices. We do not always know, without the aid of the radiogram, when or whether we have reached the apical foramen, and unless we can have this knowledge we cannot prognosticate results. With the uncertainty of our ability to cleanse and fill roots of teeth properly, we take chances of failure and serious complications when we destroy the pulps of teeth. I once made the remark that I believed that every dentist of large practice was the remote cause of the death of one or more people every year, through leaving undone things he should have done, or doing things he should not have done. If you will carefully examine the jaws of your patients with the aid of the radiogram, you will doubtless find as I have found, that at least 25 per cent of them have alveolar abscesses.

The overlapping of dentistry and rhinology is especially observable in maxillary sinus disease. Here we come into direct contact. Some years ago, in discussing the subject, I made the statement that a much larger proportion of maxillary sinus disease was caused by infections from the roots of teeth than was generally believed. The rhinologists did not agree with me. I had recently examined the skulls of sixteen cadavers and found in two of them alveolar abscesses opening into the maxillary sinus. I do not believe that any such percentage would be found if a thousand skulls were examined, but do believe that alveolar abscess is a very much more common cause of antrum suppuration than is generally supposed. This is neither strange nor surprising when we review the anatomy of the subject. If one examines a large number of skulls he will find in many little hillocks covered by very thin bone in the floor of the maxillary sinus, corresponding with the apices of the buccal roots of the first and second molars; also the second bicuspid. When teeth become abscessed, the pus, as elsewhere, goes in the direction offering the least resistance. If there is less bone between the sinus and the abscessed root than on the buccal side of the jaw, the pus will pass into the maxillary sinus. Even though an alveolar abscess does not discharge into the maxillary sinus, it may cause a

secondary infection in the antrum through continuity of tissue. We may have recurrent maxillary sinusitis, due to chronic tooth abscesses becoming acute. Sinusitis due to tooth abscesses may be irrigated by the rhinologist through the nose, week after week and month after month, without benefit, if it is due to an abscessed tooth. I do not mean to be critical of the work of the rhinologist, but the rhinologist does not always remember, as Dr. Beck has stated, that the teeth may be a cause.

Owing to the angle that radiograms are sometimes taken of molar and bicuspid teeth and as the antrum lies outside the teeth, the shadow is thrown in such a way as to give the impression in the picture that an alveolar abscess exists about the roots of these teeth, when it does not. Cryer made examinations of many skulls, and found that the canal from the frontal sinuses did not always drain directly into the nose, but opened occasionally into the maxillary sinus, the anatomical formation being abnormal. In that case, if the frontal sinus were suppurating, pus would first discharge into the maxillary sinus, and then into the nose, giving the impression that the maxillary sinus was diseased.

Inflammation of the nose or accessory sinuses may, through continuity of tissue, extend to the maxillary sinus, and this is doubtless the most common cause of antrum infection. It is quite likely that most tonsillar and pharyngeal infections are secondary to infected teeth. Few adult mouths are free from some sort of infection. As infectious material from pyorrhea pockets and alveolar abscesses is discharged into the mouth and swallowed, it passes over the pharynx and the tonsils, and in time they become secondarily involved; therefore, the essayist is quite correct in his statement, that many of the tonsillar infections are due to mouth infections primarily.

The relation between the jaws and the eyes and ears is direct, as the essayist has said, and secondary involvement of these organs from oral infections is to be expected. Bacteria of the mouth, through the Eustachian tube, may reach the middle ear very directly.

When we know that the bacteria of alveolar abscess is the same that causes heart, joint, and other lesions, we should realize the importance of the most careful and painstaking work by the dentist.

Dr. Moody, pathologist at St. Luke's Hospital, and I, have done much work on the bacteriology of alveolar abscesses. Some of you are familiar with the results of our study. The work is still being

continued with very uniform results; that is, we find in acute alveolar abscess the hemolytic streptococcus, and in chronic alveolar abscess the streptococcus viridens. The bacillus fusiformis is also prevalent. At one time I supposed that all acute alveolar abscesses were due to the staphylococcus, but we have proven beyond doubt that this is not true. It is only in a few instances that we have found any colonies of the staphylococcus.

The essayist spoke about cysts of the jaws and particularly dentigerous cysts. If I understand him, he meant cysts that contain teeth.

DR. BECK:

I spoke of three varieties of cysts, and I had no reference to any one in particular. I did speak of the dentigerous cysts.

DR. GILMER:

We find infectious cysts in the jaws very often. Formerly, we did not know the cause of these cysts; now, we feel very sure that they are due to epithelial rests, remains of unatrophied parts of the enamel organ cord or to epithelium of the peridental membrane. Root infection stimulates development of these cells and a definite epithelial lined cyst results. Microscopical examination of these cyst walls prove them to be epithelial lined.

The opening of an abscess from the anterior teeth into the nose is not uncommon. I have known of some similar cases which had been under treatment, as indicated by the essayist, for months, which was unavailing, when a cure was quickly made by removing the cause, which was an abscessing tooth.

According to my experience, the unilateral neuralgias, so-called, of the face and side of the head, are due, not to abscessed teeth, but to teeth with hyperemic pulps. If the faradic current be passed through such teeth a spasm of pain will be excited in the same locality, provided the neuralgia is due to a tooth.

Many teeth are extracted which should not be removed, but many others should be extracted which we try to save. I am removing teeth today which I would have been ashamed to have removed years ago; but my patient's health is far more important than one or two of his teeth. We must not be stampeded either by the patient or overzealous physicians to remove teeth which may be made absolutely healthy.

DR. W. H. G. LOGAN:

I shall confine my discussion to four of the six problems presented in Dr. Beck's paper. In reference to diseases of the teeth and alveoli and their relation to chronic focal infection, we find the dental and medical profession viewing this problem from two varied aspects. Groups of men maintain that every tooth should be removed about which is found a chronic infection and, on the other hand, there are those who wish to retain practically all of these teeth without regard to the extent of the disease. The sane position to take, as I see it, is that it is wrong for members of the medical profession to maintain that all such teeth should be extracted. The medical profession, as a body, has not been trained sufficiently in dental pathology to know whether a chronic infection about a tooth is extensive enough to demand its removal—therefore, the dental profession rightfully asks the courtesy of the medical profession to see to it that such patients are referred to the family dentist to see if the diseased teeth can be retained and the chronic infection about them permanently controlled without extraction. In a general way, this courtesy has not been extended by the internist to the family dentist, for I have been frequently informed during the past few years by dentists that they have had their patients taken to the hospital and many teeth removed which could have been and should have been retained throughout the life of the patient. My point is that the medical specialist should extend to the dental practitioner the same courtesy he has extended in the past to the general practitioner of medicine. On the other hand, many men in the dental profession are retaining teeth about which extensive incurable chronic infections exist. These teeth should be extracted and the diseased area about them properly treated. Hopelessly diseased pyorrhea teeth are sometimes retained because they can be made comfortable. Root ends are being amputated, often without regard to the extent of the surrounding bone involvement, to the end that in both instances the infection is only temporarily controlled and the injurious effect upon the patient is allowed to continue. The dental profession should adopt this axiom and religiously practice it day in and day out. Every tooth that has a chronic infection about the root end or along the side of the pericemental and alveolar tissues which cannot be positively controlled should be removed, even though this tooth can be made comfortable

and useful for a number of years. As an example, allow me to cite the brief history of a case.

A patient presented with a chronic infection about the lower first molar, examination showed that curved instruments could be passed between the roots from the buccal to the lingual. Long pockets were present about the middle third of the root. The tooth had never been sore nor had it given the patient any discomfort. The infection could undoubtedly have been controlled for a brief period, but the bacterial fluids of the mouth would gather in this pocket and absorption would occur even in the absence of the clinical evidence of infection. A blood examination was made and the findings were: hemoglobin, 69; red cells, 4,370,000; whites, 5,600; polymorphonuclears, 73; large mononuclears, 7; small mononuclears, 20. I refused to treat the tooth and demanded its extraction, and because it had never caused the patient any pain and the tooth was useful, my advice was not accepted. The patient went elsewhere and had the tooth retained in spite of the blood findings, which contra-indicated its retention and gave proof of possible serious danger by its retention. Since the movement has come upon us to have all teeth extracted on account of chronic infection found about them, I have been led to feel that we do not know what the usual findings are in case after case as they come into our hands. From various distinguished authorities, we find cases cited where extreme systemic effects result from chronic infections about the jaws, but I have not yet found the printed records of consecutive cases showing that such results are the rule. Therefore, to determine if pronounced systemic effects and blood changes are constant in all patients suffering from chronic infection, I have made it a part of the office routine to have a blood examination and urinalysis made of all patients coming under my observation, to determine if the lesions that would show up on this examination are relatively constant, and I have here for your investigation the reports of seventy-odd cases. It is time that many men kept such records, although, of course, it should be understood that even though we find anemia in a vast number of these cases it is not positive proof that it did not have some other origin. But if it is found that anemia is the exception in cases of chronic oral infection, the claim that it is usually so produced must be dropped.

In reference to chronic infection of the antrum, I believe it

is a wise precaution to test the bicuspid and molars beneath the diseased antrum to determine their pulp vitality. Radiograms should be taken of all that do not have vital pulps. If this rule is adhered to, the error that is frequently made of opening into the antrum from the nose, or from the mouth through the tissues above the root ends, and leaving the initial infected area in the alveolar process to reinfect the antrum, will be avoided. To test the vitality of teeth quickly and accurately, I like to rely upon the ferradic current, as suggested by Dr. Prinz.

In reference to diseases of the teeth in relation to the throat, I wish to say that I had the pleasure of calling Dr. Beck in consultation today to see a patient suffering from a throat involvement which started as a non-infective inflammation subsequent to the simple extraction of a tooth on the lower jaw. This non-infective inflammation spread from the last molar to the peritonsillar tissues by continuity. There had been a previous history of chronic tonsillar infections. The peritonsillar abscess causing our patient serious disturbance today was the result of a simple inflammation having its origin about a tooth and spreading to the bacteria-invaded field surrounding the tonsil.

In regard to cleft palate operations for closure of a continuous cleft, inasmuch as Dr. Brophy is not here, I wish to make this statement. If he were present tonight, he might say this—there is only one nasal fossa disturbed by the Brophy operation, and that is the side where the full cleft exists; the other side remains as it was found. In reference to deformity of the teeth, it is not the rule to find well formed teeth in the jaws of a cleft palate patient, whether they have been operated on or not. The presence of an abnormal septum after an operation is not positive proof that the operative procedure created it, for they are found under many other conditions.

I have enjoyed the paper very much. It is doubtful whether we have a man in the practice of medicine or surgery who has a more thorough understanding of the dental profession, and what they are trying to do, than the essayist, because of his close association with his brilliant brother, the late Rudolph Beck, who was often a guest of this society. This, I take it, is one of the reasons for his true insight into the needs of the dental profession.

DR. C. S. CASE:

This society certainly has very good reason to congratulate itself

upon the securing of Dr. Beck to present the paper of this evening, and also upon the discussions of Dr. Gilmer and Dr. Logan, which were very interesting and instructive. It is very pleasant to me to see this instance of great advancement which has come from an acknowledgment of the interdependence between dentistry and medicine.

The part which the orthodontist plays in this connection, I presume, has reference particularly to young children with inhibited development of the bones—sphenoidal, ethmoidal and superior maxillary bones—due to enlarged tonsils and adenoid vegetations closing the posterior nasal passages, preventing free breathing through the nose, etc. The peculiarity of the mucous membrane lining the nose and the sinuses and cells seems to require the action of pure air for their full activities. The ciliated mucous membrane that lines these cavities, one of whose functions is to carry the secretions out through the openings, freeing them from the possibilities of decomposing accumulations, is one of the most beautiful illustrations to me of nature's provisions that I know of. The perfect performance of the functions of the mucous membrane of these cells it seems is quite unnecessary for the development of the delicately constructed bones which it covers, as is shown when the air passages are closed by adenoid vegetations and enlarged tonsils. We do know that, through these conditions, development is markedly inhibited in children, and that it not only affects the immediate physical development and growth of facial bones, but it affects the whole system itself, even the mental activities of the child. This is repeatedly proven by operations removing the causes of mouth breathing, with marked improvement in the health of a child, often shown in a very few weeks. From the time of the operation, if it is thoroughly performed, there commences this revivifying of the stagnated activities of development, and I think that in a large proportion of these cases, without any help from the orthodontist, full restoration to normal conditions would result.

I am quite in accord with Dr. Gilmer's statement that one of the principal advantages derived from orthodontic operations is the stimulating effect of the force appliances arousing dormant activities of development. There is no doubt but widening of the arch will at times lower the dome of the arch, and increase nasal capacity, but it is only in very young children that this is proven in my

practice. I have tried it with older patients, and while it seems to enlarge the nasal cavities and to lower the dome of the arch, it may or may not be true, because the widening of the dental and alveolar arch will always give the effect of lowering the dome. It is possible, however, in very young children, where the superior maxillary development has been inhibited, that the widening of the arch does greatly enlarge the nasal cavity, but I believe it is not nearly so great as is believed by many so-called modern orthodontists. Some patients have been sent by rhinologists, who seemed to think that the superior maxillary arch could be almost immediately widened by opening the suture. Even if it is true, I do not think it good practice. Some simple appliance with moderate forces that will stimulate a revivification of the stagnated forces of growth and thus aid nature in the course which would naturally arise from the removal of the cause would in my estimation be the proper treatment.

DR. C. N. JOHNSON :

There are many features in this paper and in the splendid discussions we have listened to that I should like to take up, but I am going to refer briefly to only a certain aspect that seems to me at this time to be of particular interest. The essayist mentioned the fact that Dr. Billings has made an impression upon the medical profession and upon the dental profession with regard to the significance of focal infections in the mouth and their systemic results. That matter had been brought before the profession, as Dr. Gilmer has said, by other gentlemen, but Dr. Billings and his associates have brought these infections more vividly and more systematically before the dental profession than did either Dr. Knapp or Dr. Hunter. I believe the dental profession is under a great debt of gratitude to Dr. Billings and Dr. Hunter for pointing out these things, but I must claim on behalf of the dental profession that it pointed out these things long before medical men did. There was a time when we could not get the ear of the medical man as to the significance of oral conditions as they affect the system, and as a matter of fact there were many in the dental profession who would not listen to this doctrine when preached by dentists, but when medical men said it was true, the dentists began to sit up and take notice. In that respect we are under a deep debt of gratitude to the medical profession, not because of the discovery of the fact, because it was discovered before, but because they made it known to the dentists

in such a way that the dentists paid attention to it and are profiting by it today. I believe that the full significance of all mouth conditions as they affect the system has not been completely and thoroughly worked out yet. I believe that it remains for co-operation of the medical profession and the dental profession to work this out in a systematic and coherent manner, and when it is worked out, the people will be benefited more than they have been in the past. But now in this connection, I cannot sit down without supplementing what Dr. Logan has said in regard to jumping at conclusions by members of the medical profession concerning the effect of the teeth. I believe many teeth are likely to be extracted as the result of this propaganda which would do better service by being in the mouth and doing the patient much more good than harm. I will mention one instance that came under my notice within the last few weeks.

A lady had some affection of the finger, some swelling of the joints, and had gone from one physician to another until one physician said to her, "You must have your teeth out and tonsils removed." He made a superficial examination of her teeth. The condition in her mouth was this: she was wearing a full upper artificial denture; she had her lower teeth from the left cuspid to the right cuspid, and a bridge swung from the right bicuspid to the molar. This physician looked into her mouth without any X-ray examination (she was not in his office ten minutes), and then told her to have all the teeth taken out and the tonsils removed. She went to a physician, who told her that her tonsils were not sufficiently involved to account for her trouble, and it would be a dangerous operation to remove them under this condition. She came to me to have her teeth examined; she had been under a careful dentist. This physician told her there was pus in her mouth. I made as careful an examination of those teeth as it was possible for me to make, together with some X-ray pictures of her mouth which she had made after seeing the physician, and I promise you there was no pus in her mouth. He had seen simply some food material around the teeth, and without examining the mouth with a mirror or any exploring instrument, he merely glanced in the mouth and said there was pus there. That is not serving the best interests of that patient. Any dentist or medical man should be very careful about making such a statement as that offhand. I have

advised the patient to have the bridge removed, although the X-ray does not show anything wrong. But the X-ray picture is not infallible, and there may be something wrong. She has become so scared and skeptical of every professional man in this city that she does not know what to do, and so far refuses to have the bridge removed.

We should be more conservative in passing judgment, both dentists and physicians, and be exceedingly careful what we tell these patients. These people become so confused that they lose confidence in professional men, and I do not blame them very much sometimes. But I do think no dentist or medical man should give a snap judgment of that kind. In this particular case, I think the patient would be much worse off with all the teeth extracted than she is now. The pulps are alive and the teeth are sound with the exception of the teeth carrying the bridge, and if you have teeth with the pulps alive and healthy, and with no gingivitis, you cannot trace systemic infection to the teeth in that case. Her dentist has taken excellent care of her teeth.

DR. F. E. ROACH :

I feel more or less responsible for this pleasant evening and desire to express my appreciation to Dr. Beck personally for the splendid paper he has given us.

I have had four or five experiences in the last few months of the interdependence of medical men and the dental profession, and it has brought to my mind the important fact that we have got to come together. We must come together in regard to the various diseases that particularly concern both of us, because we have such an intimate relation one with the other. I am not going to relate my own personal experience, but I believe it is through the sincere, earnest and faithful work of our guest of the evening that I am going to be relieved of very intense suffering which I have had for the past four or five months. I believe when we as dentists and medical men come together we will relieve many people of pains they are now subjected to.

Again, I want to voice my appreciation of Dr. Beck's valuable contribution.

DR. L. L. DAVIS :

I desire to support what Dr. Johnson and Dr. Logan have said in regard to the action of medical men toward this new phase of thought, the relationship of oral diseases to systemic troubles. With-

in the last week or ten days a patient was referred to me by the family physician. The patient came to me and said, "I was sent to you by Dr. So and So; I have had a slight trouble with my fingers; my fingers show a slight rheumatic tendency, and my physician said, 'Go and have your teeth looked after.'" He opened her mouth and said, "You have pyorrhea; go and have your teeth attended to." She replied, "To whom shall I go?" She came to me. I examined her mouth carefully, and found no indication of pyorrhea whatever. She had two or three teeth in the process of being prepared ready for work, and said something about that, and said she had been going to her dentist right along up to the time the doctor told her to come to me. I said to her, "You go back to your dentist, have him finish up what he is doing, and possibly that will be all that is necessary." I also suggested that she have an X-ray taken of the tooth that had a crown on it. She did, and I got a radiogram a day or two ago and I find the lower molar that was crowned has a root filling extending down about one-quarter of an inch, and in the remaining one-quarter the root canals were unfilled. I called up her dentist, told him to take off the crown, get at the roots, and I think she will get well.

I have related this case to show how easy it is for us to pass snap judgment in any case without a thorough and careful examination. There was absolutely no pyorrhea in the mouth. Her mouth was nice and clean and very well cared for by her dentist.

DR. JOSEPH C. BECK (closing):

So far as focal infection is concerned, there is no question about it being overdone. I am aware of that fact, nevertheless, I think it is a good thing, because sooner or later the members of both professions, dental as well as medical, will find out where it is overdone. Probably some will suffer through this enthusiasm, but it requires enthusiasm to get people started and to reach a solid basis of facts. It is sometimes a good thing to dream of that which it is impossible to reach. In this discussion, interesting cases have been cited. I had a case come to me the other day who had been under the care of some of the best of men, but there was one point in the history that was entirely overlooked, and the patient was, in consequence, not benefited by the treatment. This patient for several years had had pains all over her body, but was very little benefited by any sort of treatment. The family physician was taking care

of her when this matter of chronic focal infection and its consequences came up, and talked to the family about it, and told her to go and consult a good medical man. She went to the best, and he told her to go and have her tonsils looked at by a throat specialist. The tonsils were explored, pus was expressed out of them, and the conclusion was reached that the tonsils must be taken out. The tonsils were removed, and the patient was benefited for a time, as nearly all these cases are when they have a tonsillar infection. The patient gained in weight and everybody was happy. Subsequently the pains returned. She worried about it, and it was finally thought by the family physician it might be a neuritis. She went to one of the best neurologists, who thought that injections of alcohol into the nerves might relieve her. The patient was taken back to the hospital again for a thorough examination. At the time I was called in consultation with the throat surgeon, medical man and neurologist. They said, "What are you going to do about it?" I said to them that if a thorough tonsillectomy had been performed her pain could not be traceable to that, and there probably was another cause. In studying the history a little closer I found that there was nothing said about the habits of the patient. It was subsequently found out that this patient and her husband have been drinking, for the last eleven years, from three to four highballs every day with the exception of when they could not get them. In other words, she was a chronic tippler, and from that little bit of history a diagnosis of alcoholic neuritis was made. This case illustrates in a very striking manner how some of the best and most important points in the history of a case may be overlooked.

I agree with Dr. Logan that the doctors should consult the dentists when it comes to giving advice as to the extraction of teeth. I am very careful about advising anybody to do that except through the dentist.

I have learned a good deal this evening from the discussion of Dr. Gilmer. I have a lot to work on, especially on the bacteriology, as I am very much interested in that subject. I have not access to such material as he has referred to, but certainly it is most interesting.

As to misplacement of the antrum in the X-ray pictures, and the films, I do not try to interpret films or pictures of teeth. I do not know anything about the subject of the teeth;

therefore, I do not try to get any nearer to the interpretation of the X-ray pictures except when they relate to the sinuses, and I can interpret these pictures very well. I can readily understand how a misplacement of the antrum by tilting the head would make things look as if they were diseased.

As to the test described by Dr. Logan for determining the vitality of the teeth by electricity, I have heard of it and am reminded here of the wonderful discovery in otology. It has revolutionized the tests for certain ear diseases and yet dentists have for a long time been using it, simply for testing the sensory nerve; it is what the otologist discovered so many years later and has helped so much in the diagnosis of internal ear diseases, namely, the labyrinthine test.

As to the secondary anemia from affected teeth, I think you could have that from many other conditions, because there are so many things that will cause secondary anemia. If dentists generally will accumulate a lot of material like Dr. Logan is doing regarding the blood examination and particularly the hemoglobin index, their reports will certainly be a great help in making statistics and in drawing conclusions.

DR. LOGAN:

Anemia was present only in a small percentage of the cases. The fact that a patient has it does not prove the teeth caused it. The teeth are in that condition for a long time and consequently you have anemia, and you know what it comes from. If you do not have anemia, it is not likely caused by the chronic infections.

DR. BECK:

In regard to cleft palate, personally I am familiar with Dr. Brophy's surgical work, and I would not dare to speak of it in a spirit of criticism. The point I tried to make clear was that Dr. Brophy's work is not clearly understood. Dr. Brophy does his work all right, but a great many of the men who do the same operation do not carry out the details of his technic, and hence their results are not as good.

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EDITORIAL.

WHAT SHALL BE TAUGHT IN OUR DENTAL SCHOOLS?

This is a question which has received a great deal of attention not only from the associations of dental college teachers, but from members of the profession who are not and who never have been teachers. In fact, without any intended disparagement, it may be said that the most emphatic and unreserved statements have frequently come from the latter class. It would sometimes seem that those who have never had any experience in this work are quite sure that they know how it should be done better than those who are engaged in it. This may even be true, because of the fact that those on the outside sometimes get a better perspective of any movement than those on the inside, and yet there is one thing certain that no faculty of a college could ever follow all the suggestions made, for the simple reason that many of them are diametrically opposed to each other. For instance, we are told by one set of writers that more emphasis should be placed on such fundamental studies as anatomy, physiology, chemistry, etc. These are claimed to be the basis of all the superstructure of practice to be built later such as pathology, diagnosis, etc., etc. It is claimed by men who advocate these studies that even though the student is not taught the more practical subjects, for instance, filling teeth and making crowns, that he will become reasonably proficient in these branches when he gets out to practice, but that if he does not get the foundation studies in college he never will get them, and will thus be handicapped all his life.

This sounds plausible enough, but there is another class whose whole contention is that the colleges do not properly prepare the student by giving him sufficient practical experience at the chair and bench. They deprecate "so much theory," and declaim loudly about the folly of forcing the student to learn "a whole lot of stuff that he will not need and cannot possibly use after he gets out to practice."

What is to be done? The conscientious college professor is thus seen to be ground between the upper and nether millstone. At least he is unless he has the independent temerity to go straight ahead in pursuance of his duty as he sees it, and teaches those things which his experience with students proves to him will be the most beneficial. He is not always right in his judgment, because he is human. Probably there are many men not teaching in our colleges who would make better teachers than many of those who are teaching. Matters of this kind are not always regulated in precisely the right way, or according to the eternal fitness of things, but the fact is that there likely never will be a perfectly ideal condition in dental teaching any more than there will be in other pursuits.

Surely college teachers cannot ignore the technical training which is necessary to properly equip the student to care for his patients, and just as surely they cannot ignore the foundation subjects which after all go to make of him a broad-minded and capable man. One thing they can do—they can in most instances make better use of the student's time than they do in a more systematic and rigid course, both theoretical and practical. Dental college teaching is being more and more studied through the medium of our teaching associations, and by the individual instructors themselves, and while the question as to what shall be taught will always be necessarily a mooted one, yet the problem will be more nearly solved by perfecting the work in the curriculum now in vogue than by eliminating any of the subjects from the course.

And let our friends who are not teaching please remember that it is much easier to say that a reform should be inaugurated than it is to inaugurate it.

DR. CHIAVARO AND THE ENTAMOEBA BUCCALIS.

We wish to call particular attention to the paper published in this issue from the pen of Professor A. Chiavaro of Rome, Italy, read before the American Dental Society of Europe. The significance of this paper will probably be realized more in the future than it is today, when the bacteriology of pyorrhea alveolaris will be better understood. One feature of the findings relates to the bearing which oral hygiene has upon the general conditions of the mouth as expressed by the effect of cleanliness or neglect on the constancy or prevalence of microorganisms. Professor Chiavaro's work impresses us as being very thorough and scientific, and we commend it to the careful study of our readers.

THE EDITOR'S DESK.

ABROAD IN WAR TIMES.

ANOTHER VACATION STORY.

(Continued from the November Number.)

HOTEL DES INVALIDES.

The place of all others I was desirous of visiting in Paris was the famous *Hotel des Invalides*, the institution originally established by Louis XIV as a hospital or home for aged and disabled soldiers. The word "hotel" in France has a different significance from the same word in America. It practically means "Hospital," so this building is properly speaking the hospital of the invalids. It has always been a problem in France and in fact in all of Europe to care for old soldiers—there have been so many of them. Why nations supposedly civilized should not long ago have learned the lesson that in every way war is waste is the strangest phenomenon in history, but they apparently have not, and one is reminded of this solemn fact more vividly in Europe than elsewhere. But later I shall write of this in greater detail.

The foundation of the *Hotel des Invalides* was laid in 1671, and the urgency of the need was so great that it was hurried to

completion, and in 1674 the pensioners were installed in their hospital—a really remarkable record for building in France in those days. But of course it must not be supposed that the entire structure as we see it today was completed in that time. The chapel for the soldiers was finished in 1705, but on the pretext that it was not large enough another was built at the end of the first and completed in 1715. The whole of the buildings of the *Invalides* occupy an area of 127,000 metres. (I have just learned that a metre is 39.37 inches—a little more than three feet—and those who are curious enough to wish to know how many square feet there are in the *Invalides* may do their own figuring. I haven't time.)



Hotel des Invalides.

There is a very interesting war museum, containing relics of the various campaigns in which France has been engaged. War has been a very important business with the people of Europe for centuries, and in France particularly, with its temperamental and artistic people, every little memento of war is religiously preserved and placed in museums.

But to me, and I imagine to most visitors, the feature of chief interest in the *Hotel des Invalides* today is the fact that it has been made the tomb of many of her great soldiers—the greatest of all of course being Napoleon Bonaparte. I had long cherished an ambition to visit Napoleon's Tomb and it seems that I was not the only one who cherished this ambition. In fact the books tell

us that the *Hotel des Invalides* ever since its erection has been the Mecca of nations, princes and kings. To enumerate a few I quote the following: "In 1717, Peter I, Czar of Russia; in 1768, Christian VII, King of Denmark; 1771, Gustavus III, King of Sweden; in 1775, Maximilian of Austria, the brother of Marie-Antoinette; in 1777, the Count of Falkenstein, who was to become the Emperor of Austria, Joseph II; in 1805, Pope Pius VII; in 1806, the Crown Prince of Bavaria and the Prince of Baden; in 1808, the King of Saxony, the King of Wurtemberg, and the King of Bavaria; nearer our own times, in 1842, the Czarowitz Alexander; in 1846, the Bey of Tunis; in 1852, Abd-el-Kader, and during the third Republic, all the Sovereigns who have visited France: Nicholas II, George I of Greece, Victor-Emanuel III, Edward VII, Alphonso XIII, Carlos I, Haakon VII, Christian of Denmark, and Theodore Roosevelt, the ex-president of the United States."

Can it be wondered that I was anxious to visit the *Hotel des Invalides* and gaze on Napoleon's Tomb, after all this galaxy of greatness and near-greatness had been there? What if a few imbeciles had crept into the list and looked on Napoleon's Tomb through mere idle curiosity rather than from any sense of its significance. I wanted to see it for myself and ascertain what sort of impression it would make upon me. And now I find it so difficult to tell.

First let me say something about the sarcophagus. It is constructed of antique red porphyry from Finland, discovered after several months' search for a material which was hard enough and durable enough to defy the ravages of time. In fact the blocks were so hard that when the cutting for the monument began the saw made so slight an impression on it after six months that a special steam engine was fitted up with a system of saws to cut into it. After infinite patience and work it was completed. The sarcophagus is 13 feet long, 6 feet 6 inches broad, and 14 feet 9 inches high. It is composed of eighteen jointed pieces—the top-piece only being monolithic. The supports rest on a pedestal and panels of porphyry, then on a block of green granite, and it is lined with granite of a dark red color with lilac tints brought from Corsica.

The corpse of Napoleon is enclosed in six coffins; one of tin plate, the second of mahogany, the third and fourth of lead, the

fifth of ebony and the last of oak. (Most of the men who made his fame possible have only one, and thousands of them none at all.)

Surrounding the sarcophagus in the center of the crypt are costly marbles and Mosaics. First there is a pavement of dark



The Sarcophagus.

blue marble, then a circular band of black marble inlaid with the names of such famous victories as *Rivoli*, the *Pyramids*, *Marengo*, *Austerlitz*, *Jena*, *Friedland*, *Wagram*, the *Moskewa*.

It is quite impossible to go into details regarding the art and

splendor of Napoleon's Tomb, which is one of the most magnificent and sumptuous sepulchres ever erected to a man. The work was begun in 1843 and was not finished till ten years later. The total cost amounted to nearly five million francs—about one million dollars. And it is worth it—not of course in intrinsic value, but to Paris and France it is of inestimable worth as a nursery of patriotic sentiment.



Interior of the Dome—Looking Down on the Sarcophagus.

Despite the fact that there are many things of interest in the *Hotel des Invalides* I found myself coming back again and again to Napoleon's Tomb. Here was a man who had made the most profound impression on the whole world—a man in fact who has been accounted by many as the greatest man of modern times. And yet—and yet, as I gazed down at that marvelous memorial,

and thought of the history of Napoleon, and then thought of other great men whose graves are unmarked by the slightest public recognition I was saddened by the reflection. To my mind Pasteur has done more for France and humanity than did Napoleon. Voltaire and Victor Hugo were greater than he by the best measure of a man. Tyndall, Huxley, Darwin, Spencer—but why extend the list? Hundreds of men might be mentioned who have done greater good than he, and whose chief object was the preservation of human life, as his was apparently its destruction. How many deaths were directly due to Napoleon's genius for war will never be known. He swept as a devastating fire back and forth through Europe and even down into Africa. He spread dire distress over a large part of the populace wherever he went, and the aggregate of misery following his wake can never be estimated. True, he extended the influence and widened the territory of France, but for how long? A country drunk with the lust of conquest where mere brute force and barbarism are victors cannot long maintain its glory. To deliberately go out and slaughter men because you are stronger than they are always brings its just retribution. Physically, logically, morally and ethically, Waterloo was inevitable.

And then the history of the man himself—what a spectacle of the greatness won by war! The culmination of all his glory was defeat, discredit, and humiliation coupled with the bitterness of exile. If he loved France with the passion that he claimed he did, what must have been the agony of those last sad years of his life banished to an island as remote from France as if it had been on the farthest side of the world? And the tumultuous rapidity of his downfall was even more theatrical than was his rise. To me it is the most pathetic picture in history, in proof of which permit me to quote of his power: "From September, 1805, till 1812, he is victorious throughout Europe, and creates the greatest empire of modern times. Napoleon reigns over forty-two departments beyond the old borders of France; he is king of Italy; his brother Joseph reigns over Spain, Jerome over Westphalia, Murat at Naples; he is the mediator of the Helvetic Republic and the protector of the Confederation of the Rhine, which comprises twenty-one states, of which four are kingdoms. He is all-powerful."

Then came the terrible catastrophe. In April, 1814, he abdi-

cated the thrones of France and Italy; on June 18, 1815, he was defeated at Waterloo, and on July 14 he embarked on the ship *Bellerophon* and from there to the *Northumberland* for Saint Helena. Here he lived in exile till his death on May 5, 1821. What must have been the reflections of that sad and broken man in those final years of his life!

He was not vouchsafed what to him would have been a glory—the death of a soldier on the field of battle; but must end his days in a slow and painful illness far from the scenes of his meteoric triumphs.

And what recked it to Napoleon in those dark and dismal days of his banishment that in years to come his remains were to be taken back to France and over them was to be erected the grandest monument of modern times? He knew nothing of it, and so to the man himself his life ended in failure, defeat and misery. Such is greatness—particularly that which is won by the sword.

I would rather live humbly by the side of the road where the feet of men pass by, with a vine creeping over the doors and windows, and a few flowers to hand to my fellowman; with wife and children to send me cheerily to my work in the morning and watch for my coming home at night; with the hum of the bee and the songs of the birds in my ears; with no ambition save to make those around me happy; with never a dream of walking over the dead bodies of men to ascend a throne; unheralded, unsung, unknown, and at last lying down to my final sleep with my pillow smoothed by loving hands, and the whisper of anxious hearts about the room; with the gentle footfall of tenderness and care mingled in my waking dreams, and the sighing of the softened breeze swaying the curtain at the open window—I would rather all of this, and close my eyes forever with the vision of loved ones bending over my bed to say the last farewell—I would rather this than to be Napoleon the Great with all of his victories, with all of his fame, with all the glory that came to him as the grandest warrior of his time, with all of his imperial power which he wielded like a super-king, with all of his reverses which he was brave enough to accept with grim dignity, and with the final catastrophe which banished him from his beloved France and sent him down to death in bitterness and despair. The greatest fame is fleet-

ing at best, but the fame won by war is most evanescent and treacherous of all.

Napoleon was at once the product and the victim of a temperamental people. In no other nation than France could his rise have been so transcendent, or his downfall so precipitate. And the glory of the man with all his faults was that he accepted fate when it came to him, and drained the cup to its bitter dregs. Nowhere in history is there a stronger character than that of Napoleon, and the constant pilgrimage to his tomb is but the natural sequence of the impression he left on his fellow man. If his great powers had been directed toward the achievement of cohesion among men instead of their dissolution by barbaric slaughter he might have done a greater good; but Napoleon, constituted as he was, could never have done other than he did, and the world must accept him in the light of what he achieved.

He left a lesson to mankind—a lesson not all of simulation, but rather an illustration of the fickleness of fortune, and the fleeting character of fame. He proved with vivid force the oft-repeated fact that an overweening ambition is the surest way to disintegration and defeat, and he presented the spectacle of the most ambitious and powerful man of his times thwarted in his ambition and stripped of his power in the twinkling of an eye. Such is the evanescence of fortune and fame gained by barbarism and the shedding of human blood; and this is the thing to remember—the lesson to learn—when contemplating with wonder and awe the splendid sepulchre of Napoleon the Great.

C. N. J.

(To be continued.)

BOOK REVIEWS.

A MANUAL OF DENTAL PROSTHETICS. By George H. Wilson, D. D. S., formerly Professor and Demonstrator of Prosthetics and Metallurgy in the Dental Department of Western Reserve University, Cleveland, Ohio. Second edition enlarged and thoroughly revised. 12mo, 531 pages, with 386 illustrations. Cloth, \$4.00, *net*. Lea & Febiger, Publishers, Philadelphia and New York, 1914.

The reception accorded the first edition of this splendid work must have been very gratifying to the author, and we predict an

even greater success for the new edition. This for the reason that great care has been exercised in revising the book, and in adding much valuable matter. The new studies in plaster of Paris and in vulcanite work will prove particularly interesting and instructive; as well as the subject of anatomical articulation, or as the author calls it "anatomical antagonization." Dr. Wilson has simplified this subject and put it on a more practical basis than some of those who have written on it of late, and to all who practice prosthetics the book is worth many times the price that is asked for it.

LOCAL ANESTHESIA: ITS SCIENTIFIC BASIS AND PRACTICAL USE.

By Professor Dr. Heinrich Braun, Obermedizinalrat and Director of the Kgl. Hospital at Zwickau, Germany. Translated and edited by Percy Shields, M. D., A. C. S., Cincinnati, Ohio, from the third revised German edition. Octavo, 399 pages, with 215 illustrations in black and colors. Cloth, \$4.25, *net*. Lea & Febiger, Publishers, Philadelphia and New York, 1914.

Without doubt, Braun may be considered "the father of local anesthesia." He has imparted a wider range of usefulness to the method than any other man, and in this volume he has given to the world the best that is known on the subject. To those who have not closely followed the subject of local anesthesia this book will be a revelation in the extensive possibilities of the practice. Photographs have been taken of operations performed under local anesthesia, and the range of work possible by this method is of much wider application than the average practitioner has dreamed of. The illustrations show such extensive work as "Radical operations for carcinoma of the tongue, floor of the mouth and tonsillar region." In one case resection of the upper jaw has been made for carcinoma of the hard palate, retaining the floor of the orbit; while in another the jaw has been resected together with the entire contents of the orbit. Brain surgery and other radical work is shown in such a way as to convince the reader of the efficacy of the method. To the general surgeon as well as the oral surgeon this book is of great value, as being practically the last word on this subject up to date.

ORAL ANESTHESIA. Local Anesthesia in the Oral Cavity. Technique and Practical Application in the Different Branches of

Dentistry. By Kurt Hermann Thoma, D. M. D., Assistant in Anesthesia, Harvard Dental School, Harvard University; Assistant in Dental Anatomy, Harvard Medical School, Harvard University; Fellow of the Harriet N. Lowell Society for Dental Research of Harvard University; Member of National, State and Local Dental Societies. 142 pages. Cloth. Price \$3.00 postpaid. Published by Ritter and Flebbe, Boston, Mass.

This is a very profusely illustrated volume many of the plates being in colors. There are 91 cuts in all, many of them illustrating the technique of injection for local anesthesia. The subject is well treated in the text, and a very sensible chapter has been included on "Failures and ill-effects in local anesthesia."

This chapter will prove of great value to the practitioner who is using local anesthesia extensively, and will arm him against disappointment and surprise in untoward cases. Altogether the book is to be commended as a worthy addition to the rapidly increasing literature of the subject.

CORRESPONDENCE.

FOUND AT LAST.

After my 70 years' wait I have lived to realize that there is now a porcelain gum, which can be applied to all rubber or metal plates, requiring no vulcanizing nor furnace work.

It is simply an improvement on the Synthetic material, having all its advantages, with three additional ones, viz:

It can be worked slower, does not crack and is a good flesh color, in three grades, light, medium, and dark.

I have seen it manipulated, seen the finished work and it seems to me an accomplished fact.

With the improved modernized teeth there is nothing more to be desired.

L. P. HASKELL.

PRACTICAL HINTS.

Edited by J. E. Schaefer, D. D. S.

(This department is for busy readers. We want short articles containing practical hints—the shorter the better. No article must exceed 200 words, unless of exceptional merit. Every dentist has some useful hint that has been of value to him, and if he will only put it in print it may be of equal value to others. That is what this department is for. Due credit will be given for every article sent. Address J. E. Schaefer, 1745 W. Harrison St., Chicago, Ill.)

Handling X-Ray Films:—Greater care should be taken of X-Ray films. The habit of picking a film up in one's fingers and drawing a pencil or an instrument across it to draw attention to some interesting point, cannot be too strongly condemned. The finger prints mar the film and the scratching of it certainly destroys its diagnostic value.—*Elmer S. Best, D. D. S., Minneapolis.*

Drying X-Ray Films:—After trying several methods of drying X-Ray films, I have found that the simplest is the best. We have a frame 7x23, around which is stretched white muslin. This frame rests on two shelf brackets and the films are placed on the muslin and dried. Various clips used to hang them up resulted in some defacement of the film.—*E. S. Best, D. D. S., Minneapolis.*

Number Your X-Ray Films:—All X-Ray films should be numbered and indexed. The most efficient method which we have found is to place the number on the film, in white ink, in some part of where it will not interfere with the diagnostic value. In case a film becomes detached from its holder it can easily be replaced when its number corresponds with the number on the holder.—*E. S. Best, D. D. S., Minneapolis.*

The Greater Service:—Why do we fill teeth? Is it for the simple purpose of obliterating a cavity or is there a larger purpose? Undoubtedly the time has arrived when we must cease merely to fill cavities. We should approach each operation remembering the intimate relation between teeth, mastication, digestion, assimila-

tion and health. The mouth with its masticating machine constitutes the entrance and we fail to meet our full obligation when we do not do every possible thing to keep it healthy and efficient.—*R. Davis, D. D. S., Minneapolis.*

The Safety of Nitrous Oxid and Oxygen:—So in dental uses eliminating fright or shock and physical causes such as the lodging of a tooth in the trachea (which by the way, are incidental and controllable causes only) one cannot conceive of death occurring as the result of administering the nitrous oxid and oxygen combination. It has also been proven that nitrous oxid and oxygen have no effect on the liver and kidneys nor do they destroy the functional activity of the leucocytes which resist the toxemia of infection, so we are inclined to agree that it should be the anesthetic of choice in the dental profession.—*E. A. Schmuck, D. D. S., Chicago.*

The Lips:—In a healthy person, the lips are of a bright red color, very lightly wrinkled. The thickness varies in individuals. This is also true of the amount of redness exposed. Changes in the lips and mucous membrane are very common, and of much clinical interest. Cyanotic or blue lips are due to exposure to cold, in asphyxia, pneumonia, heart disease, and some forms of intestinal toxemia. Pale lips are found in anemia, hemorrhage, chronic parenchymatous nephritis and aortic stenosis. In diabetes there is usually found a striking redness of the lips. In jaundice a yellowish tinge. In lead poisoning the blue line along the gums and the patches on the inside of the lips. Brownish patches on the palate, lips, and cheek are a diagnostic sign in Addison's disease. Observation of the lips and their changes during sickness offers, many times, valuable aid as a diagnosis.—*M. N. Federspiel, M. D., D. D. S., Milwaukee.*

The Toxicity of Local Anesthetics:—Certain things about the toxicity of the anesthetic solutions used in producing local anesthesia. There are two forms of toxemia apart from that of septic toxemia developing from the use of novocaine-supra-renin solutions, one of which is a systemic toxemia, which occurs almost

immediately or shortly after the administration of the local anesthetic, and the other (and it may, perhaps, at times be the graver toxemia of the two) is the purely local tissue toxemia, which is not manifested for twenty-four, thirty-six, forty-eight and sometimes seventy-two hours after the injection. This toxemia is not at all a septic toxemia, but one due to the fact that there has been a chemical degeneration of the more unstable of the two drugs used in the solution, namely, the suprarenin or adrenalin. Suprarenin bitartaric as it should be technically termed should be used, because it is more uniform and more stable, but that would undergo the typical adrenalin degeneration if brought in contact with any of the alkalis, and frequently our hypodermic syringes are boiled in solutions containing carbonate of soda. It will deteriorate sometimes because of the mere trace of alkali in distilled water; absorbed from the glass of certain bottles in which it is kept; because of the combination of heat and humidity oftentimes, or because of exposure to light.—*J. E. Nyman, D. D. S., Chicago.*

Mixing Amalgam:—Proper mixing is best done by the use of a deep glass mortar, the inner surface of which has been slightly dulled (not ground) and pestle of such design as to afford a firm grasp being taken of its handle. The head of the pestle should also be slightly dulled. The time required, and the rapidity of movement of the pestle necessary for thorough amalgamation, make the use of the shallow mortar impracticable because of the danger of loss of some of the contents during the operation. A rough inner surface of the mortar tends to grind the alloy, which is objectionable to say nothing of the extreme difficulty in completely removing the plastic mass, and keeping the mortar clean.

Mixing in the deep glass mortar should be done thoroughly by a rapid movement of the pestle in such manner as to keep the mix always at the bottom of the mortar, this will necessitate the constant rubbing or shaking down of that portion which collects on the sides. The force exerted in mixing should not be one of grinding, but of moderate rubbing together, to accomplish the most complete amalgamation. Such mixing should be continued for two minutes by the watch as a minimum length of time, followed by kneading the mass in the hand one minute, this time requirement

applies to all mixes made of from ten to thirty grains of alloy, but a mix of less than ten grains might require a little less time, and a mix of more than thirty grains will require more time. Some alloys may possibly require a little more time for mixing but never less,—I am speaking of the high grade alloys containing 65 to 73 per cent of silver, as these are the only alloys worthy of consideration.—*Wm. E. Harper, D. D. S., Chicago, Ill.*

Catarrhal Stomatitis:—The term catarrh, as you all know, means inflammation of any of the mucous membranes. Catarrhal stomatitis is an acute inflammation of the buccal mucous membrane, met occasionally in adults, but most commonly in children.

Etiology: The common primary causes are bad mouth hygiene and fermentation of food debris, sharp edges of teeth, too hot or cold foods, salivation with mercury, smoking and alcoholism. This condition is often associated with eruptive fevers; measles, scarlet fever, influenza, typhoid, and with gastro-intestinal disturbances.

Symptoms: The mouth feels hot to the examining finger, swelling and dryness are present, with salivation and general soreness; the tongue is slightly furred showing the papillae in relief as minute bright red spots. Similar spots on the buccal mucosa mark the mouths of the mucous follicles. Congestion and desquamation of epithelial cells may result in slight surface ulceration. There is a craving for cold drinks, moderate fever, intestinal disturbances, usually diarrhea; patient is restless and suffers from insomnia. The duration of an attack is about one week.

Treatment: Look to the cause and relieve that, saline catharsis in all cases, magnesium citrate solution serves the purpose admirably. In children ice may be given to suck, and bromides are sometimes needed to induce sleep. Locally, boroglyceride solution applied with a swab, or diluted and used as a mouth wash by adults; or more preferably an iodine preparation, as the following—Tincture of Iodin 3 drachms, Liquor antisepticus, q.s. ad Three ounces. Sig. A tablespoonful to a wineglass of water as a mouth wash. Or—Alum, 10 grs. to the ounce of water has a very soothing effect, and tends to reduce the congestion.—*P. G. Puterbaugh, M. D., D. D. S., Chicago.*

MEMORANDA.

[Society notices will be given insertion in this department free of charge. Subsequent insertions will be charged for at the rate of \$2.00 an inch.]

A FRAUD.

A man operating through Ohio—and possibly in other States—has been taking subscriptions for *THE DENTAL REVIEW* without any authority and pocketing the money. He is described as being about 35 years old, tall, smooth faced, light in complexion, and pretended to be deaf and dumb. Look out for this man.

IDAHO STATE BOARD OF DENTAL EXAMINERS.

The next meeting of the Idaho State Board of Dental Examiners for the examination of candidates will be held in Boise, Idaho, commencing Monday morning, January 4th, at nine o'clock. For application blanks and particulars write to A. A. Jessup, Sec'y. Box 1414, Boise, Idaho.

AMERICAN INSTITUTE OF DENTAL TEACHERS.

The annual meeting of the American Institute of Dental Teachers will be held at Ann Arbor, Michigan, January 28th, 29th and 30th, 1915. There will be a number of interesting papers, reports and discussions by prominent dental educators. All dental teachers are cordially invited to be present.—J. F. Biddle, Secretary. 517 Arch street, N. S. Pittsburgh, Pa.

TRIBUTE TO DOCTOR CHARLES HENRY TILLOTSON, BY THE EASTERN ILLINOIS DENTAL SOCIETY.

Again has the shadow of the death angel fallen across the portals of our Society and a kind friend and loving brother has been called from our councils forever. The mere words which we can say but feebly symbolize the depth of our sorrow in the loss of one whose life was the embodiment of the highest and best principles.

But the "Grim Harvester, who has all seasons for his own" has claimed him and we look and listen in vain for the form and footsteps of him who was ever welcome in our assemblies.

To his bereaved family we tender our deep sympathies in the loss of a kind and loving husband, son and brother.

To those who compute the span of life in days and years his life may seem unfinished and his death untimely. But to him who measures life in heart throbs and who gauges its fullness by depth, not length of living, the life work of Charles Henry Tillotson is a volume complete, and the memory of his virtues will live on as an inspiration to all who came within the radius of his influence.

Lightly may the sods rest over thy narrow home, beloved friend and brother, and peaceful and calm be thy slumber and may the zephyrs of the evening that breathe above thy silent resting place bring to us the whisperings of hope that we, too, inspired by the example of thy virtues may merit at last the joys that are thine in the spirit land. E. E. Jones, Guy F. Corlev, E. H. Hickman, Committee.

THE PANAMA PACIFIC DENTAL CONGRESS.

The attention of the world is centered on this event, and here the educators, scientists and promoters of every form of progress, will gather to teach and learn the things that tend to the betterment of humanity. Not to be outdone by any trade or profession, and fully realizing the magnitude

and importance of its task, the Dental profession of the Pacific Coast has prepared a congress, the Panama Pacific Dental Congress, to be a part of the great educational undertakings of the Exposition, and invites the dental profession of the world to come and participate in its program, its pleasures and its profits. No one can afford to miss this opportunity to attend the greatest of the world's expositions, and the greatest of our professional congresses. No expense or labor, thought or care is being spared to make the Panama Pacific Dental Congress mean for dentistry what the Exposition means to all the varied industries and interests of the world. The plans of the Congress are so far advanced that its success is more than assured. Its program is rapidly acquiring contributions from the leaders in every branch of dental science and art; its exhibits will embrace all that is best in dental commerce and education, and the entire congress will afford an opportunity for the practical acquisition of a vast fund of useful professional information. Every dentist on earth who cares for his own advancement, or the welfare of his patients or profession, should at once apply to the Executive Committee of his country or state for membership in the Congress, and arrange to be present at its opening ceremonies in San Francisco, California, August 30th, 1915.

NATIONAL DENTAL RELIEF FUND.

To the Members of the National Dental Association:

The favorable response which you made last year in the introduction of a Christmas Seal, as a means to increase our Relief Fund, was most gratifying to your Committee. Realizing as we did, we were in a degree following the course of another organization, yet we felt assured, inasmuch as we were working for the same purpose, the relief of our suffering brothers, we should be, as we were, sustained by your liberal endorsement and contributions in excess of number of Seals sent you. We were handicapped last year, first by delay in having our design satisfactorily printed, stoppage by Post Master General, and much clerical expense, so we were unable to get the Seals in the hands of our members until about the first of December. However, with all our disadvantage we brought out Fund up to \$9,620. Profiting by experience, this year our expense will be nil, and the Seals can now be had at the Dental Supply Houses, or this office. The necessity of a Relief Fund is made more manifest by repeated appeals to your Committee by members who are suffering for the necessities of life, surely we should this year by our large increase in number, easily increase this Fund by purchase of Seals, and annual contributions which we are about to solicit, up to a sum, (not less than thirty thousand dollars), then from accrued interest, we could begin to respond to these calls from our unfortunate—and it's no exaggeration—when we say suffering members. Brothers, a little from each will accomplish this much desired ideal. Will you do it?

In sending your orders to this office, 63 Trumbull St., New Haven, Conn., make all checks payable to National Dental Relief Fund, as your check becomes a receipt, saving expense in acknowledgment. Fraternalty yours, L. G. Noel, W. T. Chambers, James McManus, E. S. Gaylord, Chairman National Dental Relief Fund Committee.

FEDERATION DENTAIRE INTERNATIONALE AT THE PANAMA PACIFIC INTERNATIONAL EXPOSITION, SAN FRANCISCO 1915.

Another assurance that the European war will not harm the Panama-Pacific International Exposition came today to James A. Barr, director of congresses and conventions for the exposition. The Federation Dentaire Internationale, the highest authority in dental matters, has chosen San Francisco as the 1915 meeting place from August 30th to September 9th.

The international character of this great organization is shown by the fact that the honorary president, Dr. W. B. Patterson is of London; Dr Truman W. Brophy, president, is of Chicago; the vice presidents are of Paris, Edinburgh, Vienna, Buenos Aaires, Frankfort-on-Main, Naples and Strassburg; the secretary-general is from Madrid; and the assistant secretaries are of Brussels, The Hague, Paris and Madrid.

This organization has charge of the organization of all International Dental Congresses and is the clearing house of the most important dental questions. It is made up of the individual members of the profession, and according to Dr. Arthur M. Flood, who has been active in bringing the organization to San Francisco, it means a great attendance although there are no regular delegates.

The entertainment of its members will be in the hands of the organizations of all the Pacific coast states.

Another great dental organization, the Delta Sigma Delta fraternity strong in the United States, Central and South America, yesterday notified the exposition that it would meet during the same period as the International Federation. This is the third dental fraternity announcing its intention of meeting here the coming year and makes a clean sweep of every dental organization in the United States, except the state societies, many of which also will be here.

The attendance of the supreme chapter meeting of Delta Sigma Delta is estimated by Dr. Flood at from 3,000 to 10,000 and the international federation sessions may draw many more than this number.

Dr. Burton L. Thorpe, of St. Louis, is secretary of the International Federation and head of the Delta Sigma Delta fraternity. He has been influential in bringing both meetings to San Francisco.

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